TECHNICAL MANUAL
NO. 11-5805-650-12
TECHNICAL ORDER
NO. 31W2-2TT-11

HEADQUARTERS
DEPARTMENTS OF THE
ARMY AND THE AIR FORCE
Washington, DC, 25 January 1985

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL FOR TELEPHONE SET TA-838/TT (NSN 5805-00-124-8678) AND TELEPHONE SET TA-838A/TT (NSN 5805-01-125-5976)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATT: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703-5007.

For Air Force, submit AFTO Form 22 (Technical Order System Publication Improvement Report and Reply) in accordance with paragraph 6-5, Section VI, T.O. 00-5-1. Forward direct to prime ALC/MST.

In either case, a reply will be furnished direct to you.

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*This manual supersedes TM 11-5805-650-12&P/TO 31W2-2TT-11, dated 12 April 1976, including all changes. The repair parts and special tools list is now contained in TM 11-5805-650-20P.

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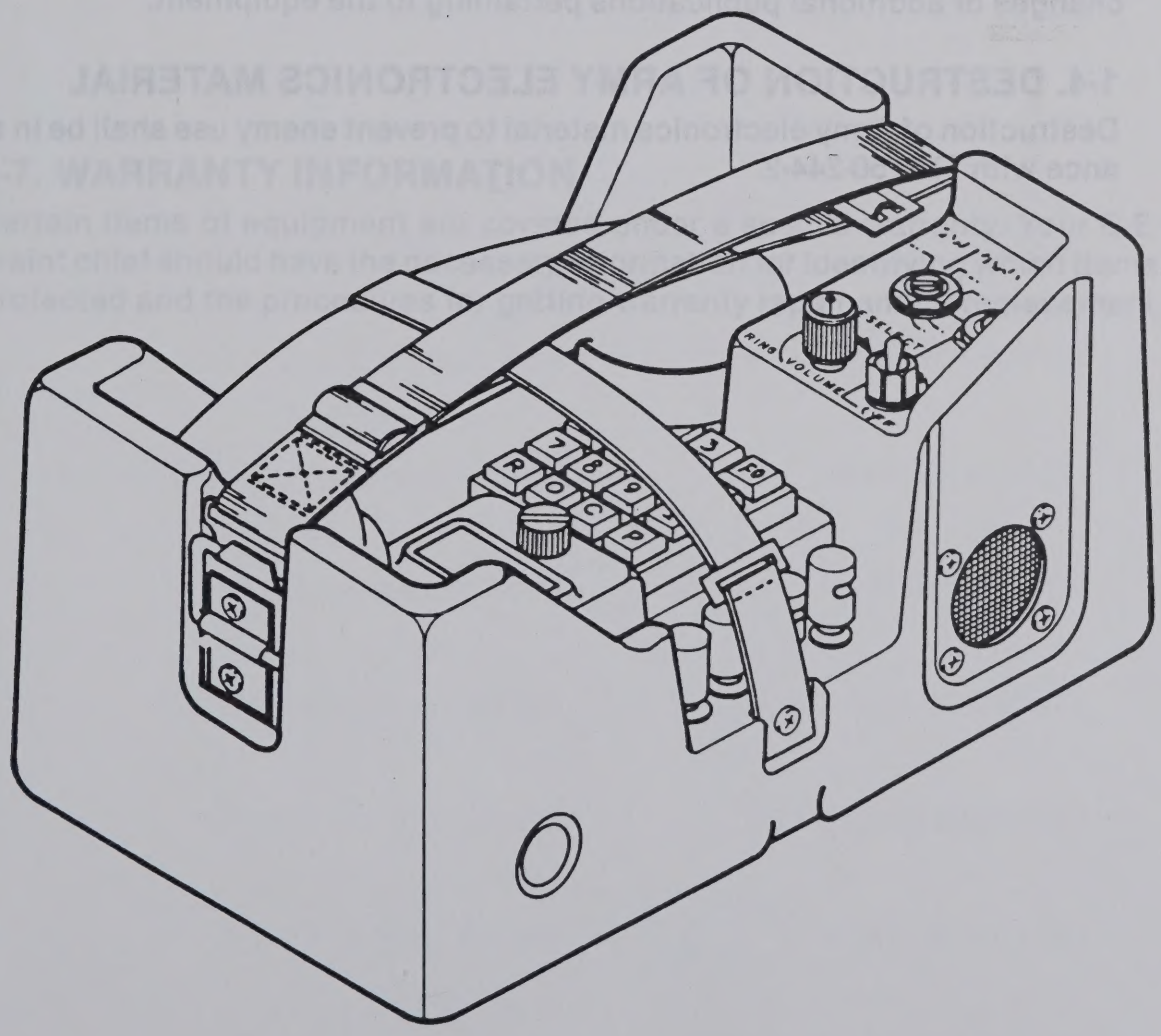
CHAPTER I
INTRODUCTION

Section I. GENERAL INFORMATION

1-1. SCOPE

This technical manual covers Telephone Set TA-838/TT and later model TA-838A/TT. Instructions are given for:

- installation.
- operation.
- preventive maintenance.
- troubleshooting.
- operator/crew maintenance.
- organizational maintenance.



1-2. MAINTENANCE FORMS, RECORDS AND REPORTS

Reports of Maintenance and Unsatisfactory Equipment

- Department of Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750 as contained in Maintenance Management Update. Air Force personnel will use AFT 66-1 for maintenance reporting and TO-00-35D4 for unsatisfactory equipment reporting. Navy personnel will report maintenance performed utilizing the Maintenance Data Collection System (MDCS) IAW OPNAVINST 4790.2, Vol 3 and unsatisfactory material/conditions (UR submissions) IAW OPNAVINST 4790.2, Vol 2, Chapter 17.

Reporting of Packaging and Handling Deficiencies

- Fill out and forward SF 364 (Report of Discrepancy (ROD) as prescribed in AR 735-11-2/DLAR 4140.55/NAV MATINST 4355.73A/AFR 400-54/MCO 4430.3F.

Discrepancy to Shipment Report (DISREP) (SF 361)

- Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 261) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.190/DLAR 4500/15.

1-3. CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS

Refer to latest issue of DA PAM 310-1 to determine whether there are new editions, changes or additional publications pertaining to the equipment.

1-4. DESTRUCTION OF ARMY ELECTRONICS MATERIAL

Destruction of Army electronics material to prevent enemy use shall be in accordance with TM 750-244-2.

1-5. ADMINISTRATIVE STORAGE

- Equipment issued to and used by Army activities will have preventive maintenance performed in accordance with PMCS chart prior to administrative storage.
- When removing the equipment from administrative storage, the PMCS should be performed to assure operational readiness.

1-6. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

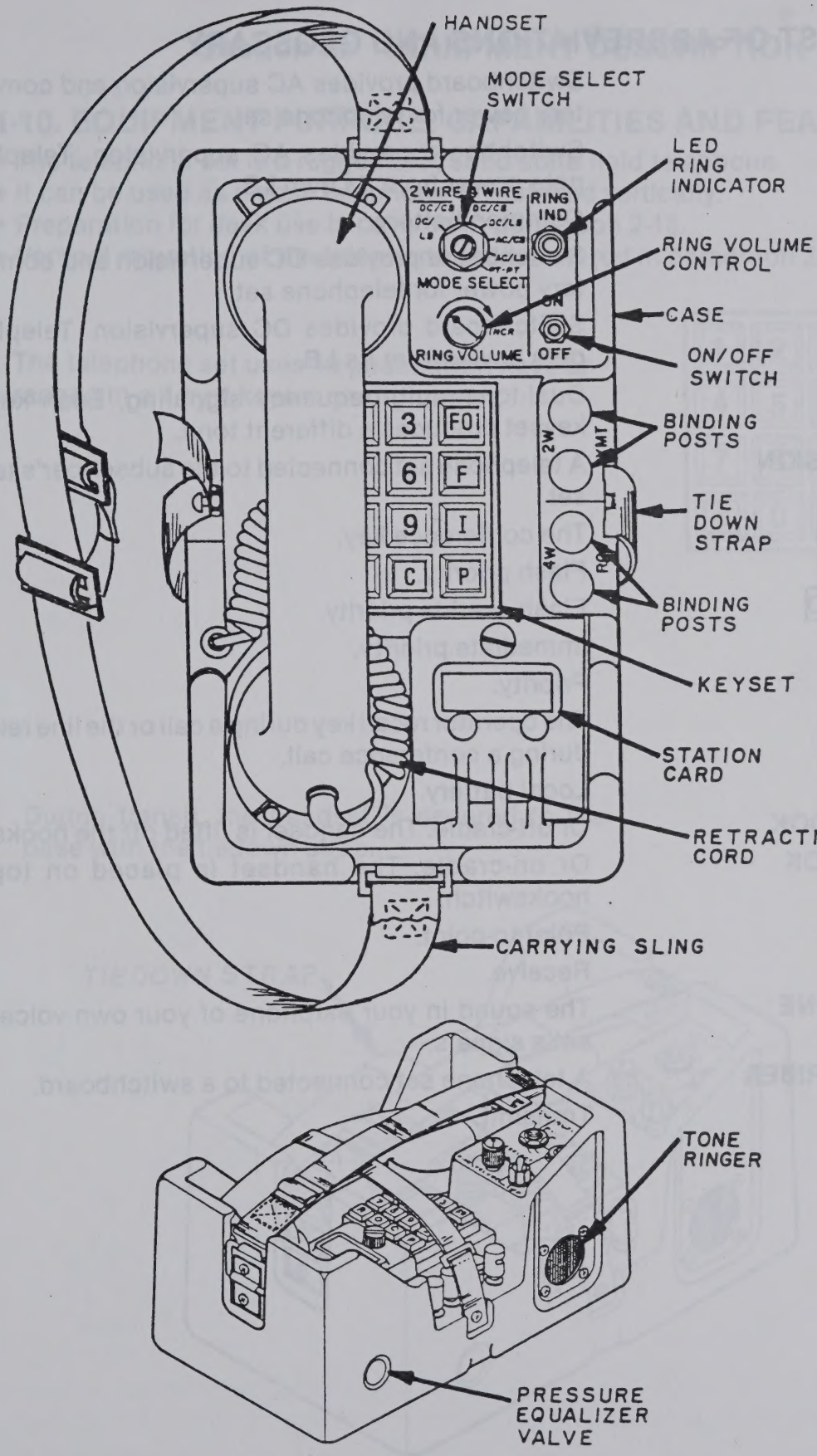
If your TA-838/TT telephone needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, NJ 07703. We'll send you a reply.

1-7. WARRANTY INFORMATION

Certain items of equipment are covered under a special warranty. Your C-E org maint chief should have the necessary information for identifying which items are protected and the procedures for getting warranty repair and/or replacement.

1-8. NOMENCLATURE CROSS-REFERENCE

COMMON NAME USED IN THIS MANUAL	TO DESCRIBE
TELEPHONE SET	Telephone Set TA-838/TT and TA-838A/TT.
HANDSET	Handset assembly.
RETRACTILE CORD	Cord assembly, electrical handset.
CASE	Shell, telephone base.
BINDING POSTS	Post, binding electrical.
MODE SELECT SWITCH	Switch, rotary.
RING VOLUME CONTROL	Resistor, variable.
KEYSET	Switch, push, telephone.
CARRYING SLING	Sling assembly, carrying.
TIEDOWN STRAP	Strap assembly, tiedown, handset.
TONE RINGER	Horn, loudspeaker.
STATION CARD	Plate, marking, blank.
LED RING INDICATOR	Diode, light emitting.
ON-OFF SWITCH	Switch, toggle, sealed.
PRESSURE EQUALIZER VALVE	Equalizer assembly, air pressure.


HANDSET
MODE SELECT SWITCH
LED RING INDICATOR
RING VOLUME CONTROL
CASE
ON/OFF SWITCH
BINDING POSTS
TIE DOWN STRAP
BINDING POSTS
KEYSET
STATION CARD
RETRACTILE CORD
CARRYING SLING
2 WIRE
4 WIRE
RING IND
MODE SELECT
RING VOLUME
ON
OFF
2W
XMT
4W
RCV
TONE RINGER
PRESSURE EQUALIZER VALVE

1-9. LIST OF ABBREVIATIONS AND GLOSSARY

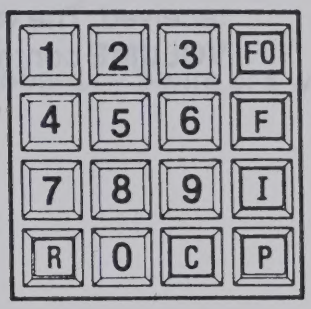
AC/CB	Switchboard provides AC supervision and common battery power for telephone set.
AC/LB	Switchboard provides AC supervision. Telephone set gets power from its own LB.
CB	Common battery.
DC/CB	Switchboard provides DC supervision and common battery power for telephone set.
DC/LB	Switchboard provides DC supervision. Telephone set gets power from its LB.
DTMF	Dual-tone-multi-frequency signaling. Each key on the keyset produces a different tone.
EXTENSION	A telephone set connected to the subscriber's telephone set.
KEY C	The conference key.
KEY F	Flash priority.
KEY FO	Flash overide priority.
KEY I	Immediate priority.
KEY P	Priority.
KEY R	The operator recall key during a call or the line release key during a conference call.
LB	Local battery.
OFF-HOOK	Or off-cradle. The handset is lifted off the hookswitch.
ON-HOOK	Or on-cradle. The handset is placed on top of the hookswitch.
PT-PT	Point-to-point.
RCV	Receive.
SIDETONE	The sound in your earphone of your own voice on your set's signals.
SUBSCRIBER	A telephone set connected to a switchboard.
XMT	Transmit.

Section II. EQUIPMENT DESCRIPTION

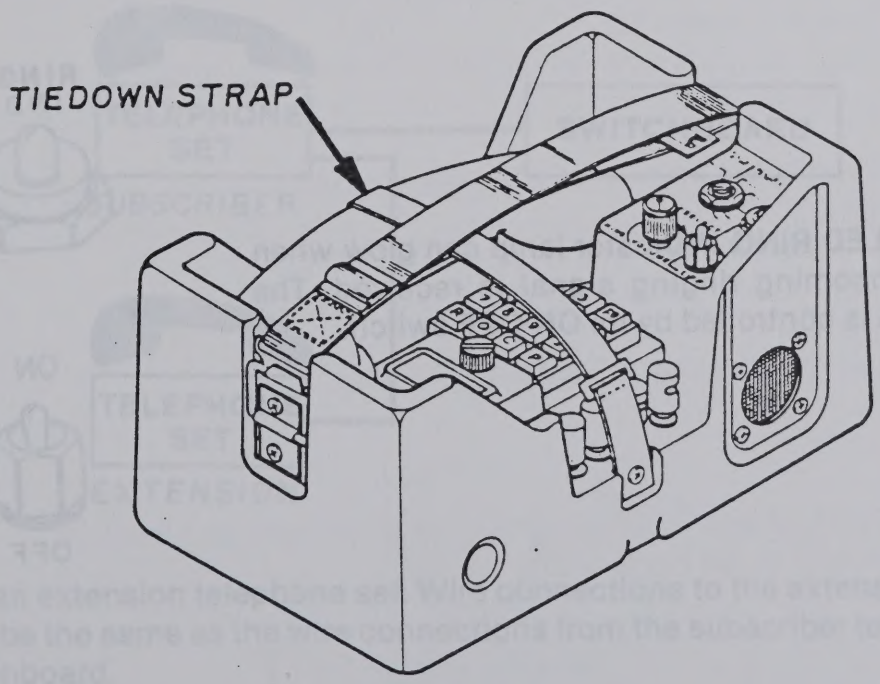
1-10. EQUIPMENT PURPOSE, CAPABILITIES AND FEATURES

- The telephone set is a ruggedized, solid state field telephone.
- It can be used as a desk telephone or installed vertically.
- Preparation for desk use is covered in paragraph 2-18.
- Vertical mounting of the telephone set is covered in paragraph 2-19.

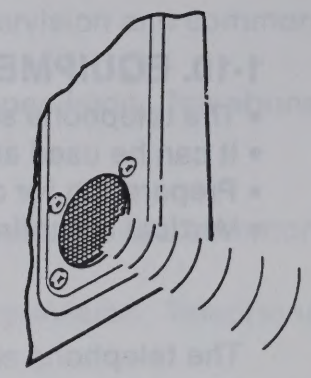
The telephone set uses 16 pushbutton keys arranged in a 4 by 4 keyset configuration.

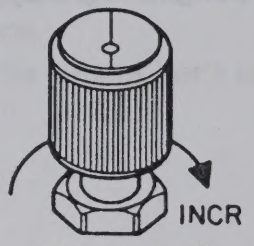


During transit, the handset is secured to the base with the tiedown strap.



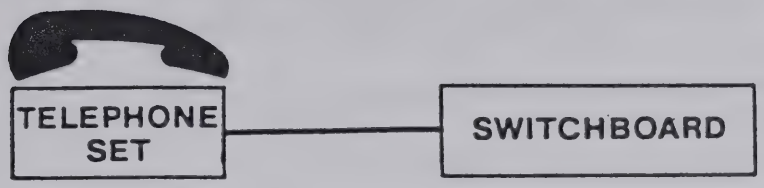
A tone ringer (miniature loudspeaker horn) sounds when an incoming ringing signal is received. The volume is controlled by the **RING VOLUME** control.



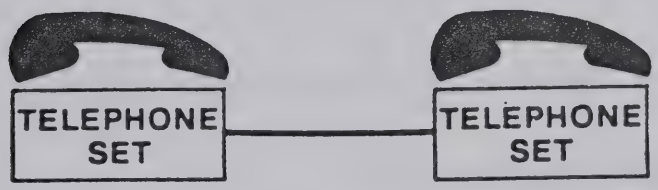


The **LED RING IND**icator lamp can glow when an incoming ringing signal is received. The lamp is controlled by its **ON-OFF** switch.

1-11. TYPICAL USE OF THE TELEPHONE SET

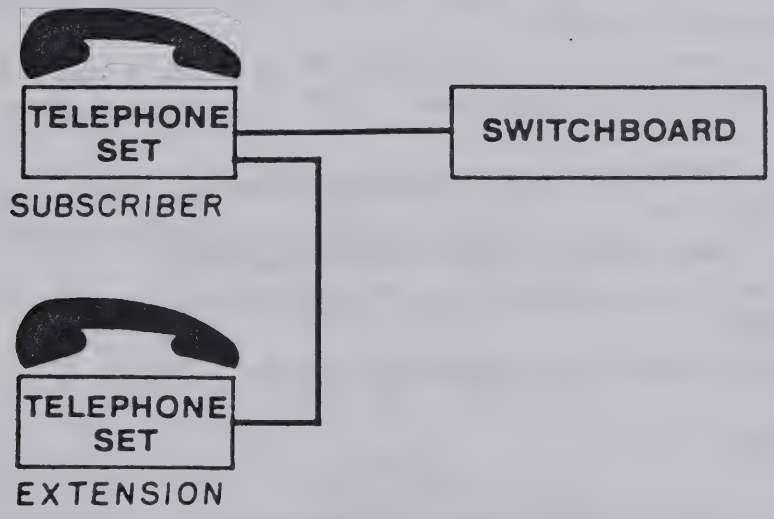


Used as a subscriber telephone set connected to the switchboard by 2-wire or 4-wire lines.



POINT TO POINT

Used to connect directly to another Telephone Set by 4-wire lines.



Used as an extension telephone set. Wire connections to the extension telephone set must be the same as the wire connections from the subscriber telephone set to the switchboard.

1-12. DIFFERENCES BETWEEN MODELS

Telephone Set TA-838/TT and Telephone Set TA-838A/TT look very much alike, however, their internal circuitry is different.

Some models may have a:

- newer type LED RING INDicator lamp.
- protected ON-OFF switch.
- different retaining spring bracket.

The installation and use of these two sets is exactly alike.

These two sets are operationally interchangeable.

1-13. EQUIPMENT DATA

TRANSMISSION FREQUENCY RANGE:

- 300 to 3,500 Hz.

DISTANCE RANGES WITH DC SUPERVISION:

- The telephone set is located less than 4 miles from the switchboard.

DISTANCE RANGES WITH AC SUPERVISION:

- The telephone set can be located more than 4 miles from the switchboard.

TEMPERATURE RANGES:

- Operating temperature range from −30°F to +150°F (−35°C to +66°C).
- Storage temperature range from −70°F to +160°F (−57°C to +71°C).

BATTERY POWER FOR ARCTIC OPERATIONS:

- 4 each BA-3042/U.

BATTERY POWER FOR ALL OTHER OPERATIONS:

- 4 each BA-42 or equivalent (Type C flashlight cell).

DIMENSIONS:

- Packaged (6″ high by 10″ deep by 6″ wide).

WEIGHT:

- 6.5 pounds.

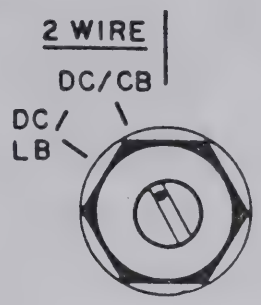
NOTE: Detailed technical data and specifications can be found in Appendix E in the back of this manual.

Section III. PRINCIPLES OF OPERATION

1-14. FUNCTIONAL DESCRIPTION

The telephone set may be operated in any:

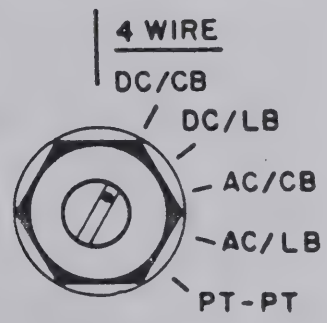
- Two modes of operation when connected to a **2-WIRE** circuit,



MODE SELECT

or

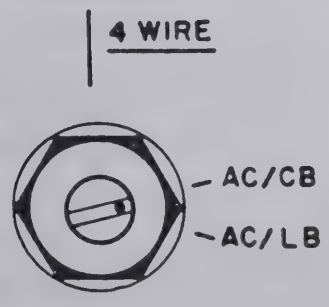
- Five modes of operation when connected to a **4-WIRE** circuit.



MODE SELECT

The MODES may be **AC** supervision modes:

- When the switchboard has an ac signaling capability.

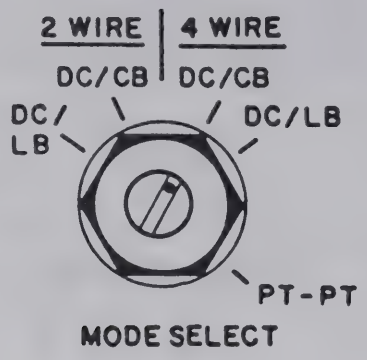


MODE SELECT

or

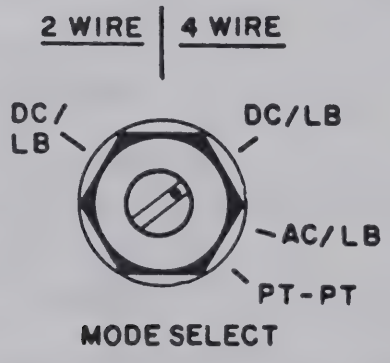
These MODES may be **DC** supervision modes:

- When the switchboard has a dc signaling capability.

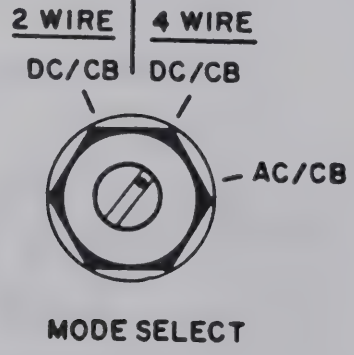


Power for the telephone set is available from:

- The 4 internal batteries when the **MODE SELECT** switch is set to either **2-WIRE DC/LB, 4-WIRE DC/LB, 4-WIRE AC/LB or 4-WIRE PT-PT.**



- The switching center when the **MODE SELECT** switch is set to either **2-WIRE DC/CB, 4-WIRE DC/CB or 4-WIRE AC/CB.**



The telephone set has a tone signaling capability. The electronic circuits in the set will generate a different tone signal for each key you press on the keyset.

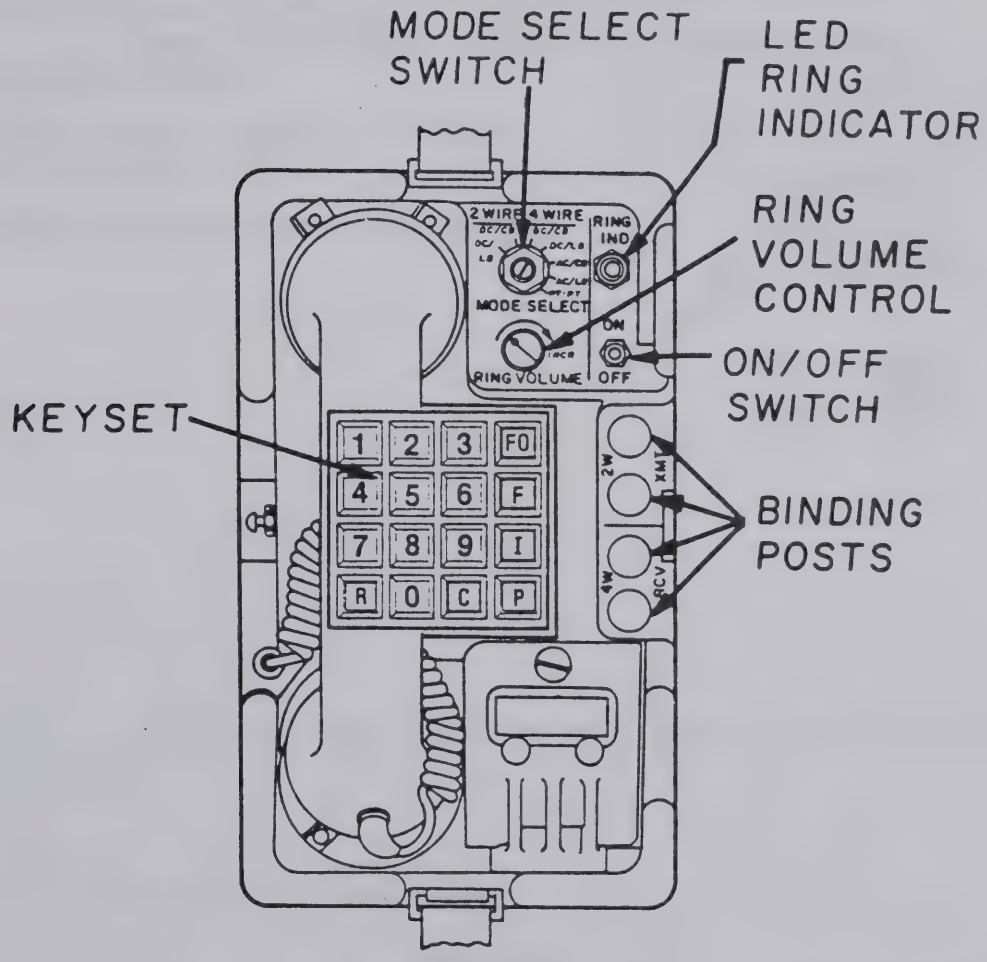
The signaling technique is often called DTMF or dual-tone-multi-frequency signaling.

The telephone set can accept either ac or dc incoming ringing signals in either the AC or DC modes.

The function of the binding posts is to connect the telephone set to either 4 or 2-wire circuits.

The function of the **RING VOLUME** control is to adjust the level of sound from the tone ringer.

The function of the **ON-OFF** switch is to control the **LED RING IND**icator lamp. The lamp will glow when the switch is set to **ON** and a ringing signal is received.



The exact function of each control and how to make different types of calls are described in Chapter 2.

Two to four telephones sets can be bridged (connected in parallel) to provide extension service. The wire connections to each extension from your telephone set must be the same type as the wire connections from the switchboard to your set. If a 4-wire connection is made to your set, all extensions from your set must have 4-wire connections. If a 2-wire connection is made to your set, all extensions must have a 2-wire connection.

The exact function of each control and how to make different types of calls are described in Chapter 2.

CAUTION

THIS TELEPHONE SET MUST BE USED WITH COMPATIBLE TELEPHONE EQUIPMENT.

DO NOT TRY TO DESIGN YOUR OWN TELEPHONE SYSTEM. GET INSTRUCTIONS AND PERMISSION FROM YOUR TEAM CHIEF IF YOU ARE ASKED TO MAKE A HOOKUP DIFFERENT THAN THE HOOKUPS DESCRIBED IN THIS MANUAL.

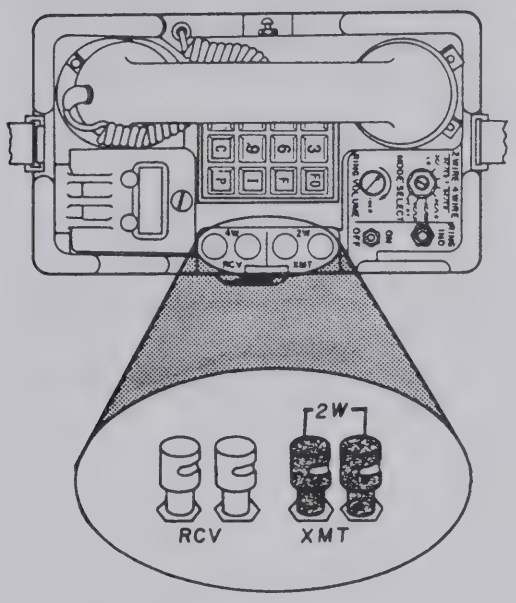
CHAPTER II
OPERATING INSTRUCTIONS

Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS, INDICATORS AND RECEPTACLES

2-1. BINDING POSTS

The two **XMT** binding posts are color coded black and marked with **2W.**

The two **RCV** binding posts are color coded red.



The wires connected to the binding posts must be clearly identified at all times. The wires may be

- tagged.
- color coded.
- identified as directed by the team chief.

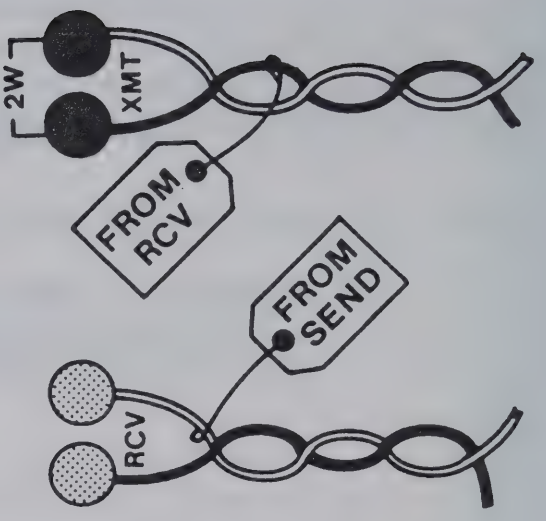
CAUTION

DO NOT ATTEMPT ANY WIRE CONNECTIONS IF THE WIRES ARE NOT CLEARLY IDENTIFIED. ASK YOUR TEAM CHIEF FOR INSTRUCTIONS IF YOU HAVE ANY QUESTIONS.

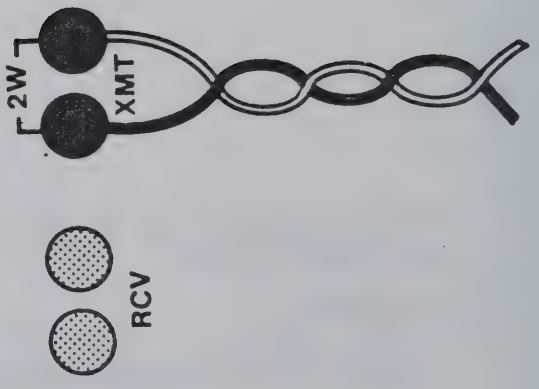
For 4-wire operation, the pair of wires identified FROM RCV are connected to the **XMT** binding posts.

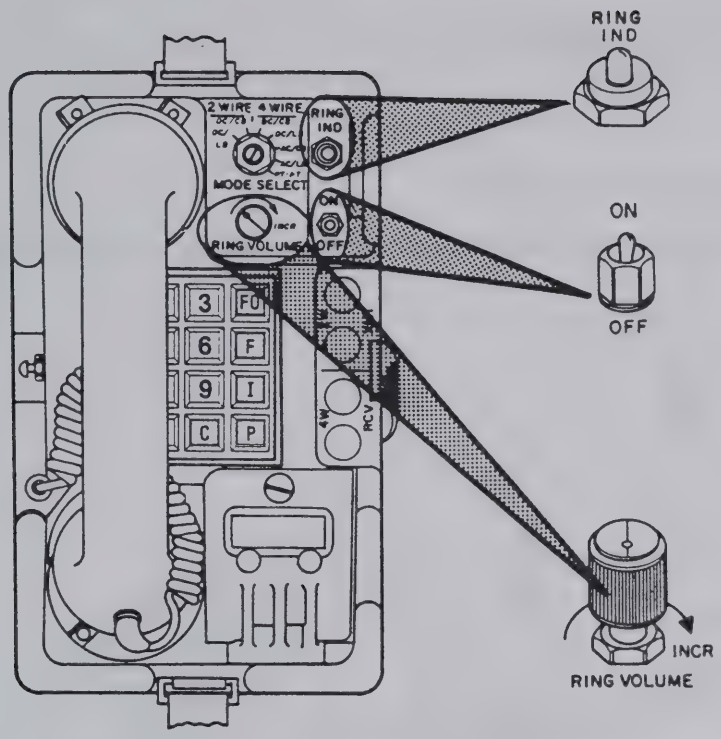
and

the pair of wires identified FROM SEND are connected to the **RCV** binding posts.



For 2-WIRE operation, the send/receive pair of wires are connected to the **XMT** binding posts. No wires are connected to the **RCV** binding posts.





2-2. LED RING INDICATOR LAMP

Controlled by the **ON-OFF** switch.

The **LED RING IND**icator lamp will glow when a ringing signal is received.

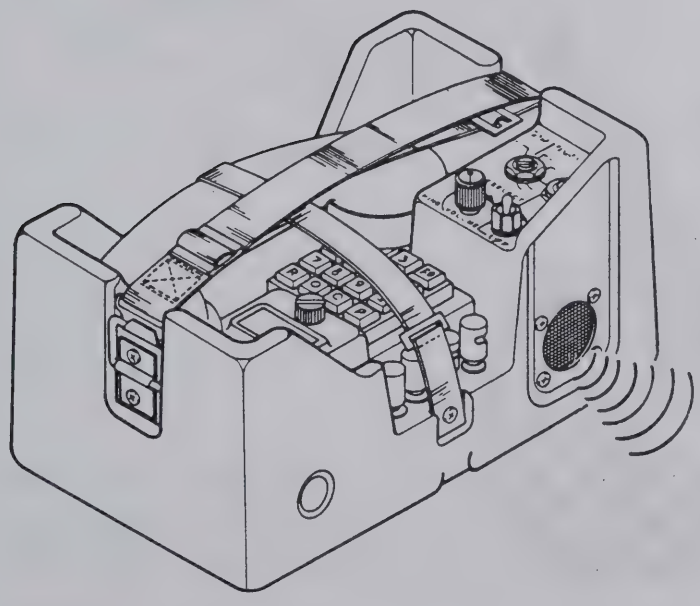
2-3. ON-OFF LED SWITCH

ON will allow **LED RING IND**icator lamp to glow when a ringing signal is received.

OFF disconnects the lamp.

2-4. RING VOLUME CONTROL

Controls the volume of the tone ringer (a miniature loudspeaker horn).



2-5. TONE RINGER

Gives off an audible signal when a ringing signal is received. Located on the side of the telephone set.

2-6 HANDSET AND HOOKSWITCH

The handset is attached to the telephone set by a retractile cord.

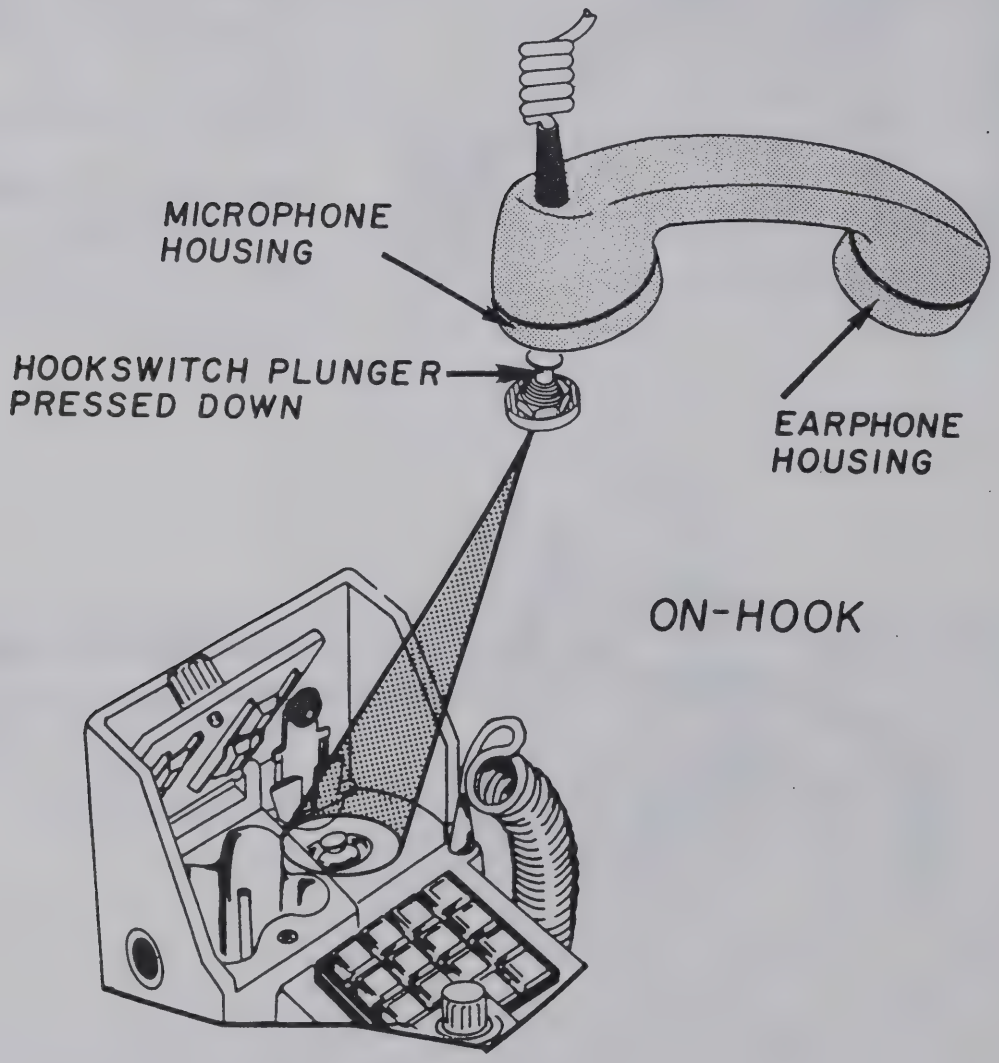
When the handset is not in use (on-hook):

- It is placed on top of the hookswitch

and

- The hookswitch plunger is pressed down.

The telephone set ringer circuits are now connected to receive a ringing signal.

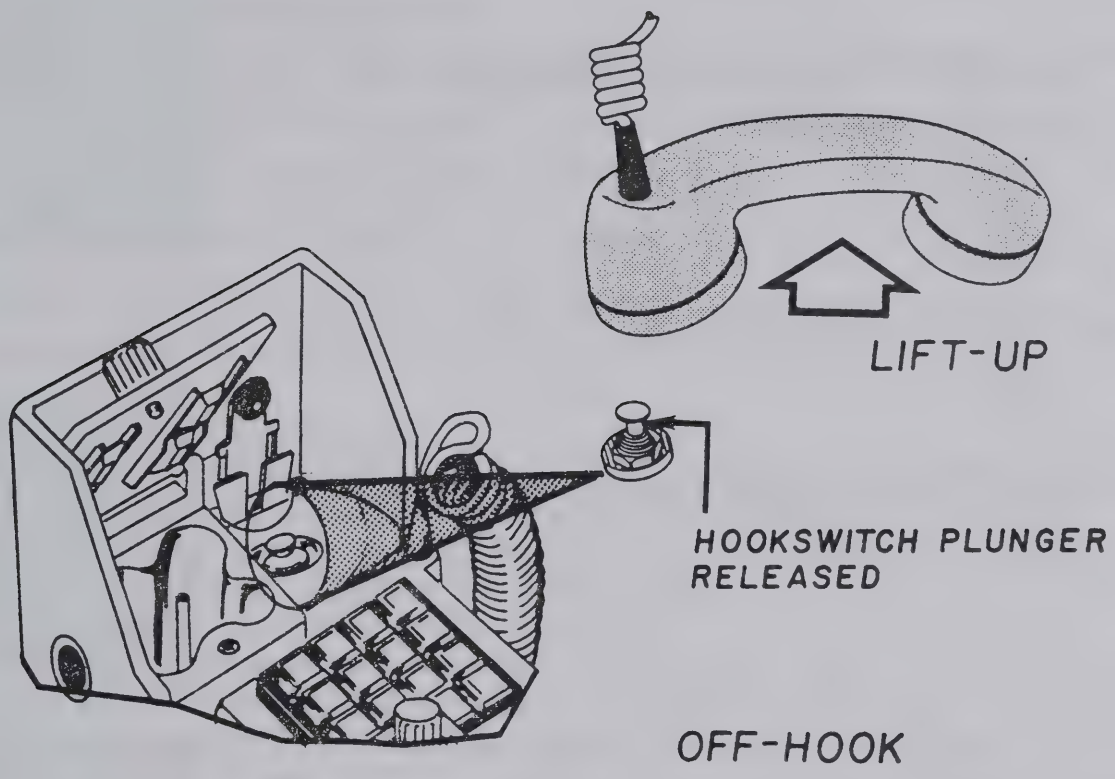


When the handset is lifted off the hookswitch (off-hook):

- The ringer circuits are disconnected,

and

- the telephone set sends an off-hook signal to the distant equipment (switchboard or telephone set).



When the handset is placed upon the hookswitch (on-hook) after a call is completed:

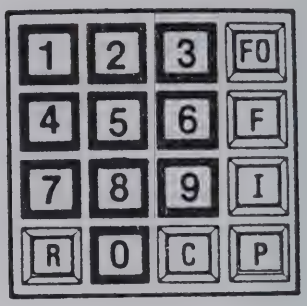
- The telephone set sends an on-hook signal to the distant equipment,

and

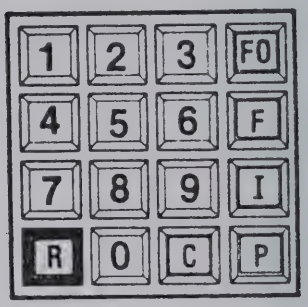
- the ringer circuits are connected.

2-7 KEYSET

Digit Keys [1] through [0] are used to reach the desired party.



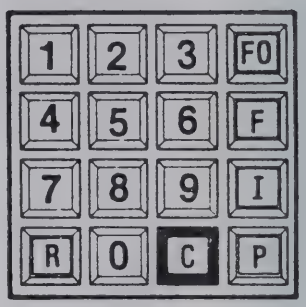
Key [R] is used to contact the operator if necessary during a call,



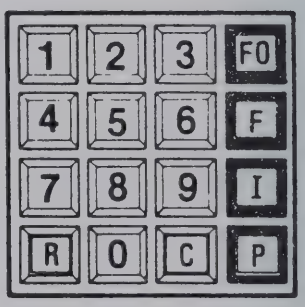
or

to release a line during a conference call.

Key [C] is used to start a conference call with certain switchboards.



Key [FO], [F], [I] and [P] are used to setup a priority call.



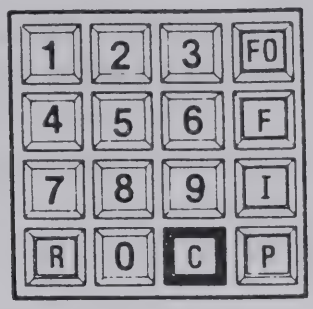
Conference calls can be provided in three ways by the telephone set.

The types of conference call available depends on the type of switchboard used with the telephone set,

and

Whether your telephone set has been assigned the conference call privilege.

Key [C], the conference key is used to start a conference call (only with certain switchboards)



Preprogrammed conference call

- Usually available when the telephone set is connected to Automatic Telephone Central Office equipment AN/TTC-38(V) or AN/TTC-39(V).
- This type of conference call will automatically place calls and establish conferences between predesignated parties.
- Any of the predesignated parties may start this type of conference call.
- This call is started by pressing the conference key [C] and then keying in the assigned conference code number.
- Before placing a preprogrammed conference call, ask your team chief for the assigned conference code number and for other special instructions.

Progressive conference call

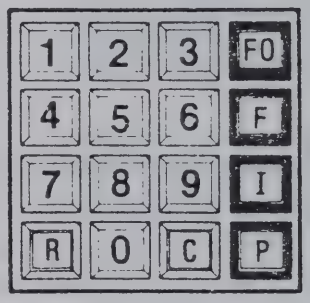
- Usually available when the telephone set is connected to Automatic Telephone Central Office equipment AN/TTC-38(V) or AN/TTC-39(V).
- The number of parties that can be included in a progressive conference call depends on the exact type of switchboard used.
  Ask your team chief for this information.
- This type of conference call allows you to start a conference call hookup by calling each desired subscriber one at a time. You must press the conference key [C] before keying in the telephone number of the subscriber. Wait for the called subscriber to answer and then repeat the procedure to call the next desired subscriber.
- Before placing a progressive conference call, have handy all of the telephone numbers of the subscribers you want in on the call.

Operator assisted conference calls

- The switchboard operator can set up a conference call for subscribers who are not assigned the conference call privilege.
- Switchboard operator assistance is required when your telephone set is connected with Automatic Telephone Switchboard SB-3614 (V)/TT or Automatic Telephone Central Office AN/TTC-41 (V).
- The conference key [C] is not used during operator assisted conference calls.

Priority calls can be made with the telephone set if:
- the central office switchboard is programmed for priority operation, and
- your telephone set has been assigned a priority rating.

Keys [P], [I], [F], and [FO] are used for priority calls



These priority keys correspond to these levels of priority:

Key [P] = priority (lowest level of priority)
Key [I] = immediate (next to lowest level)
Key [F] = flash (next to highest)
Key [FO] = flash override (highest priority)

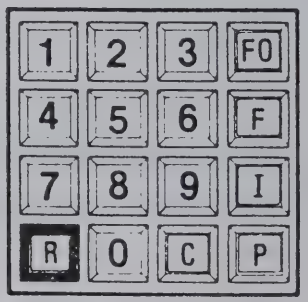
To make a priority call:
- Press the appropriate priority key before pressing any other keys.

Your priority call can break in on a call already in progress if the call in progress has a lower priority than the call you are placing.

If a priority call breaks into a call already in progress, a pre-empt tone signal will be heard by all parties.

Telephone calls made without a priority rating are handled as routine by the central office switchboard.

Key [R] may be used to:
- reach the operator during a call.
  or
- release a line during a conference call. This may be necessary if the called party does not answer or the line is busy.



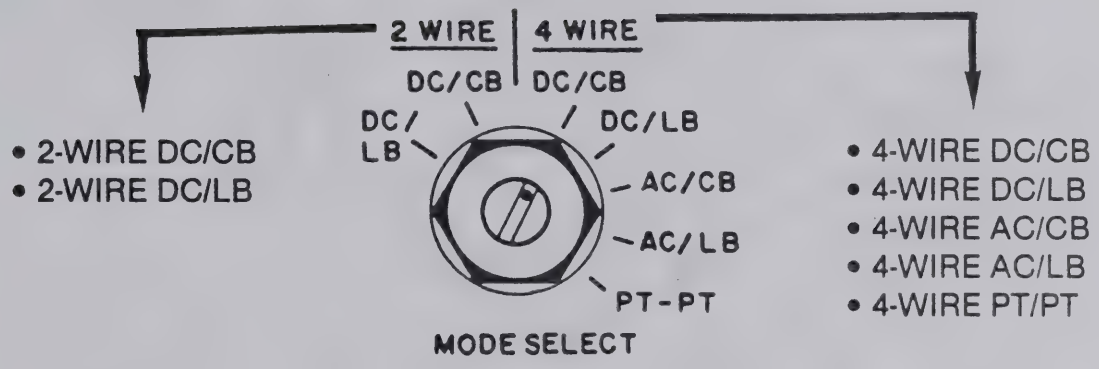
2-8. MODE SELECT SWITCH

The **MODE SELECT** switch sets up the telephone set for one of seven modes of operation.

If the **MODE SELECT** switch is set to an incorrect position, the telephone set is automatically disconnected.

The mode of operation is determined by the team chief.

You will be given specific instructions on the mode of operation, including:

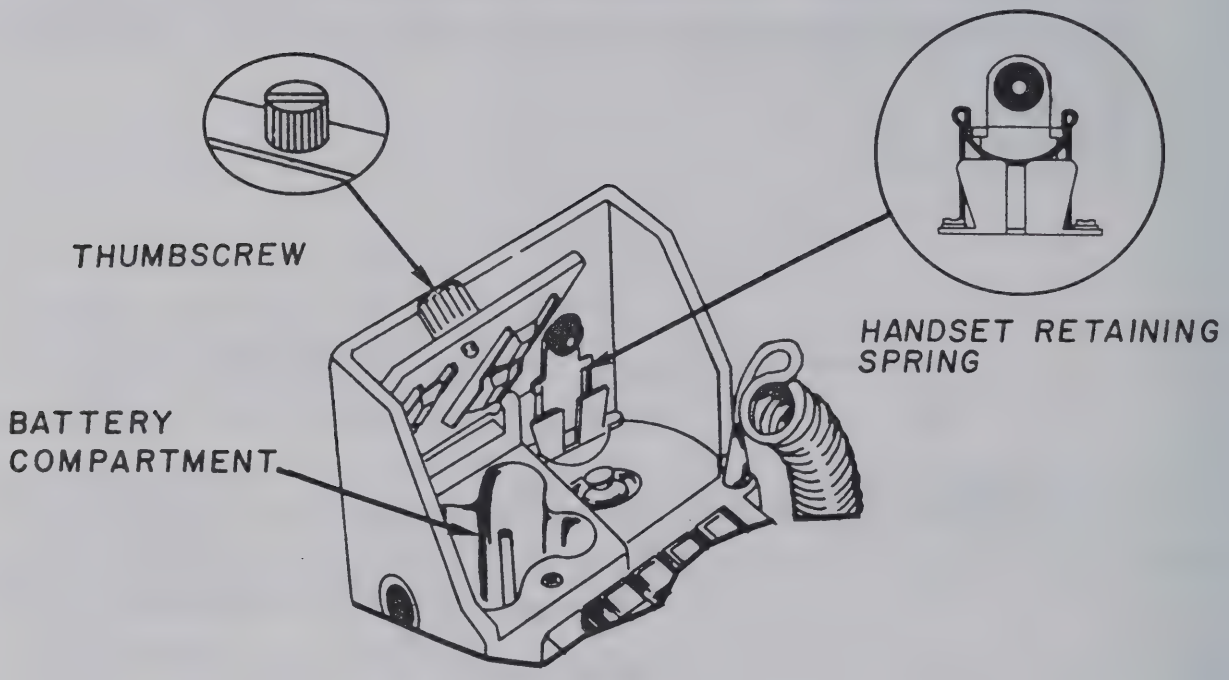


CAUTION

DO NOT GUESS THE POSITION OF THE MODE SELECT SWITCH. GET INSTRUCTIONS FROM YOUR TEAM CHIEF.

2-9. BATTERY COMPARTMENT

The four batteries are located inside the battery compartment. The hinged compartment cover is locked in place by turning the thumbscrew clockwise.



2-10. HANDSET RETAINING SPRING

The handset retaining spring is a double-torsion spring that can be latched back out of the way of the handset. An unlatched spring provides a retaining action on the handset when the telephone set is mounted in the vertical position. The spring is normally latched when the telephone set is used as a desk set.

2-11. CARRYING SLING

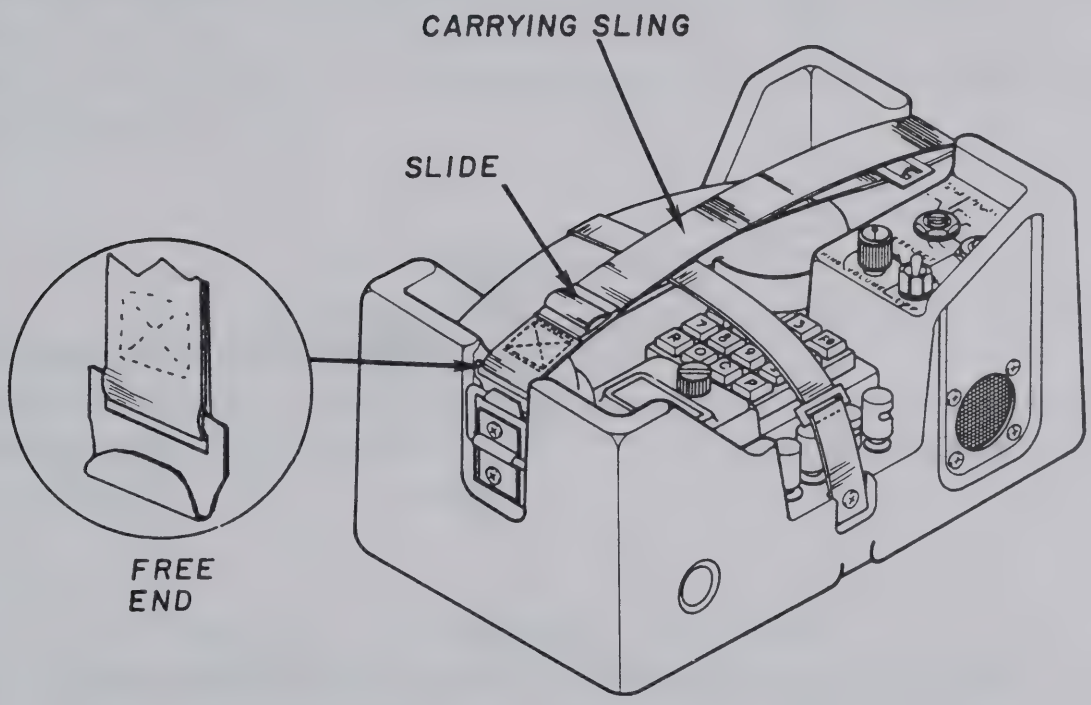
The carrying sling is used to carry the telephone set and for vertical mounting.

It is positioned out of the way when the telephone set is used as desk set.

The carrying sling is fastened down with its strap fastner when the equipment is not in use.

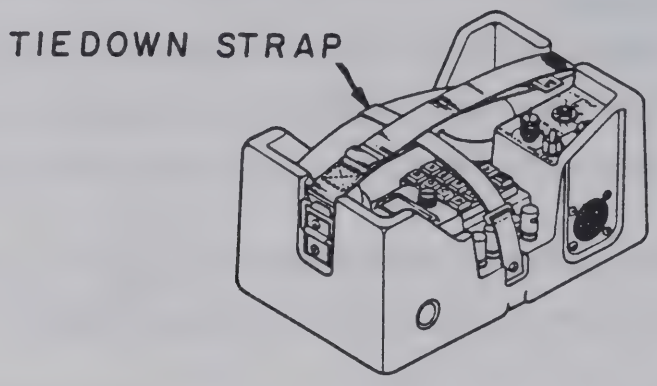
Its length is adjusted by pulling the webbed belt through the two slides.

The lip on its free end is used to clip it to a retainer on the case.



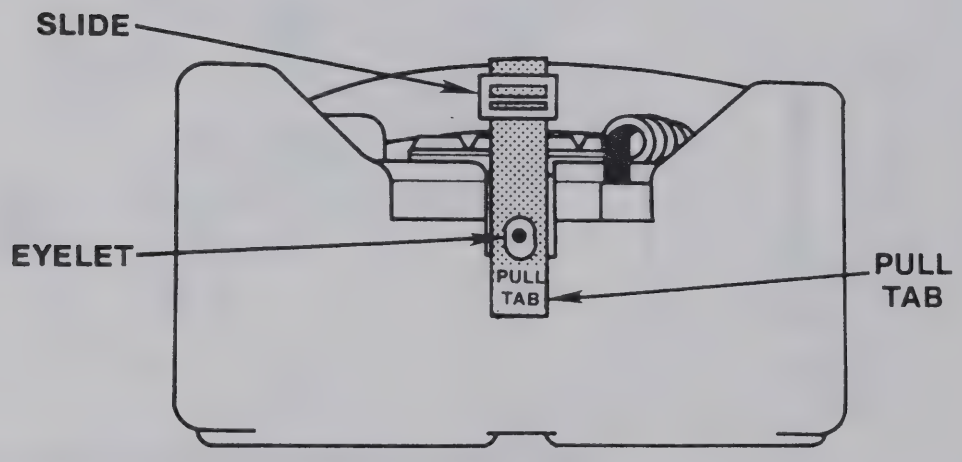
2-12. TIEDOWN STRAP

Used to securely hold the handset in place during shipment.



It should be snapped under the case when the telephone is in use.

Its length is adjusted by pulling the webbed belt through the slide.



The eyelet on the end marked PULL TAB snaps onto a fitting on the side of the case.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

2-13. GENERAL

To be sure that your equipment is always ready for your mission, you must do scheduled preventive maintenance checks and services (PMCS).

Before operation perform your **B** PMCS to be sure that your equipment is useable.

During operation perform your **D** PMCS. This should help you spot problems before they become big problems.

After operation perform your **A** PMCS. This should help keep your equipment in top shape.

Weekly and monthly PMCS are important checks you make to keep serious problems from suddenly happening.

Routine checks like cleaning, dusting, checking for frayed cords, stowing equipment when it is not in use and checking for loose hardware are not listed as PMCS steps. These are things that should be done as required. If you find a routine check in your PMCS, it is listed because other operators have reported problems with this item.

2-14. PMCS PROCEDURES

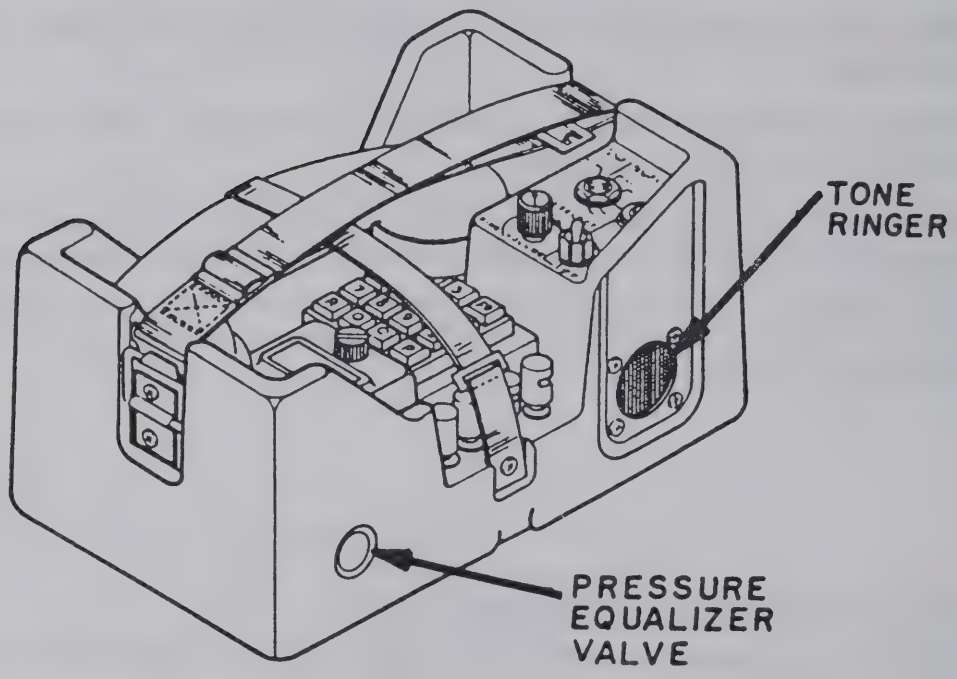
When you are doing any PMCS or routine checks, keep in mind the warnings and cautions shown in this manual.

CAUTION

THE OPERATOR IS ONLY AUTHORIZED TO OPEN THE BATTERY COMPARTMENT. THE OPERATOR IS NOT AUTHORIZED TO OPEN THE SET FOR ANY OTHER REASON OR TO MAKE ANY INTERNAL CHECKS, ADJUSTMENTS OR REPAIRS.

CAUTION

THE TONE RINGER (A MINIATURE LOUDSPEAKER HORN), AND THE PRESSURE EQUALIZER VALVE ARE NOT TO BE REPLACED OR REPAIRED BY THE OPERATOR OR BY ORGANIZATIONAL MAINTENANCE. IF YOU FIND THESE ITEMS DAMAGED OR INOPERATIVE, REPORT THEM TO HIGHER ECHELON MAINTENANCE.



CAUTION

DO NOT USE SOLVENTS TO CLEAN ANY PART OF THE TELEPHONE SET.

2-15. USE OF DA FORMS 2404 WITH PMCS

If your equipment must be in operation all of the time, check and service those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment is shut down.

Use the item no. column in your PMCS table to get the number for the item no. column on DA Form 2404 (Equipment Inspection and Worksheet) when you fill out the form.

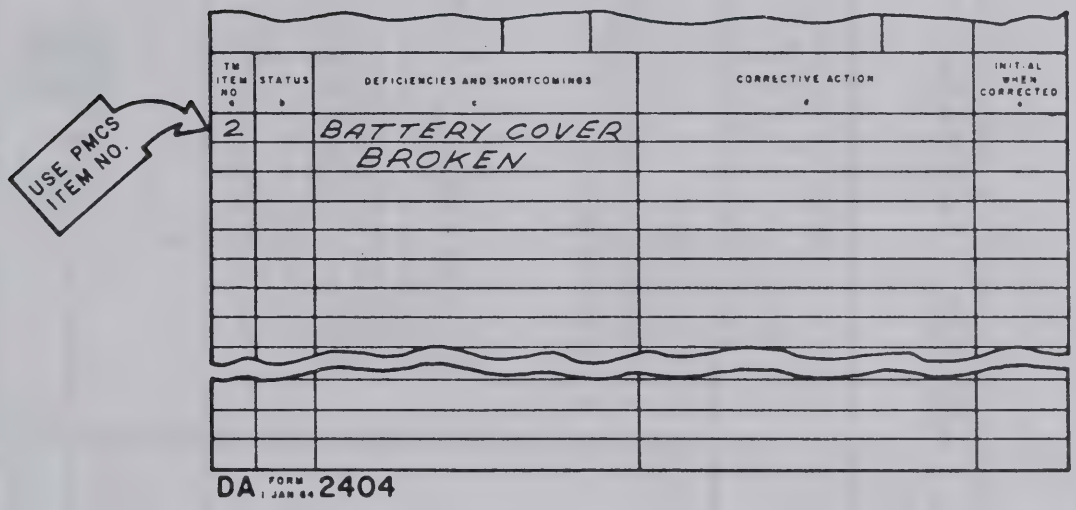


TABLE 2-1 OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B-BEFORE OPERATION **A**-AFTER OPERATION **M**-MONTHLY
D-DURING OPERATION **W**-WEEKLY

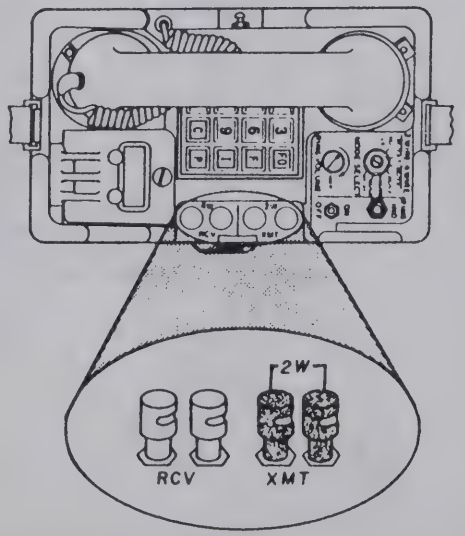
ITEM NO.	INTERVAL					ITEMS TO BE INSPECTED	PROCEDURES	FOR READINESS REPORTING, EQUIPMENT IS NOT READY, AVAILABLE IF:
	B	D	A	W	M			
1	•		•			BINDING POSTS	CHECK FOR: • PROPER HOLDING ACTION • LOOSENESS 	ANY BINDING POSTS CANNOT HOLD A WIRE

TABLE 2-1 OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (Continued)

B-BEFORE OPERATION **A**-AFTER OPERATION **M**-MONTHLY
D-DURING OPERATION **W**-WEEKLY

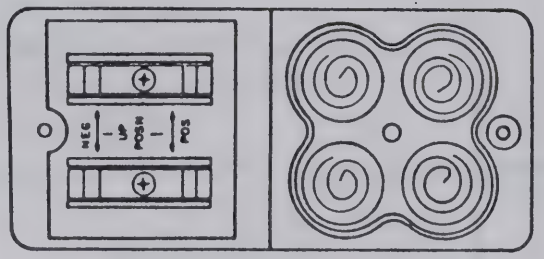
ITEM NO.	INTERVAL B	D	A	W	M	ITEMS TO BE INSPECTED	PROCEDURES	FOR READINESS REPORTING, EQUIPMENT IS NOT READY, AVAILABLE IF:
2	•		•	•		BATTERY COMPARTMENT AND COVER.	REMOVE BATTERIES AND: CHECK TO SEE THAT • CONTACTS ARE NOT CORRODED OR LOOSE INSERT BATTERIES AND MAKE SURE • COVER CLOSES SECURELY  **CAUTION** REMOVE THE BATTERIES IF THE TELEPHONE SET IS TO BE STORED OR TO CHECK SPRING CONTACTS.	BATTERIES CANNOT BE HELD IN PLACE.

TABLE 2-1 OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (Continued)

B-BEFORE OPERATION **A**-AFTER OPERATION **M**-MONTHLY
D-DURING OPERATION **W**-WEEKLY

ITEM NO.	INTERVAL					ITEMS TO BE INSPECTED	PROCEDURES	FOR READINESS REPORTING, EQUIPMENT IS NOT READY, AVAILABLE IF:
	B	D	A	W	M			
3	•		•			HANDSET AND RETRACTILE CORD	CHECK FOR: • CRACKED HANDSET • MISSING MICROPHONE OR EARPIECE. • FRAYED OR DAMAGED RETRACTILE CORD • LATCH ACTION OF THE HANDSET RE-TAINING SPRING	HANDSET CANNOT BE USED FOR COMMUNICATIONS

TABLE 2-1 OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (Continued)

B-BEFORE OPERATION **A**-AFTER OPERATION **M**-MONTHLY
D-DURING OPERATION **W**-WEEKLY

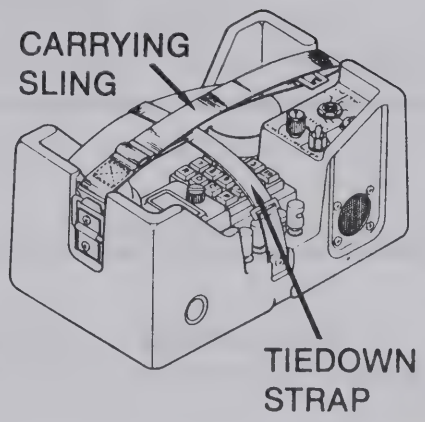
ITEM NO.	INTERVAL					ITEMS TO BE INSPECTED	PROCEDURES	FOR READINESS REPORTING, EQUIPMENT IS NOT READY, AVAILABLE IF:
	B	D	A	W	M			
4	•		•			CARRYING SLING AND TIEDOWN STRAP	CHECK FOR: • FRAYED STRAPS • PROPER LATCH ACTION  	

TABLE 2-1 OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (Continued)

B-BEFORE OPERATION **A**-AFTER OPERATION **M**-MONTHLY
D-DURING OPERATION **W**-WEEKLY

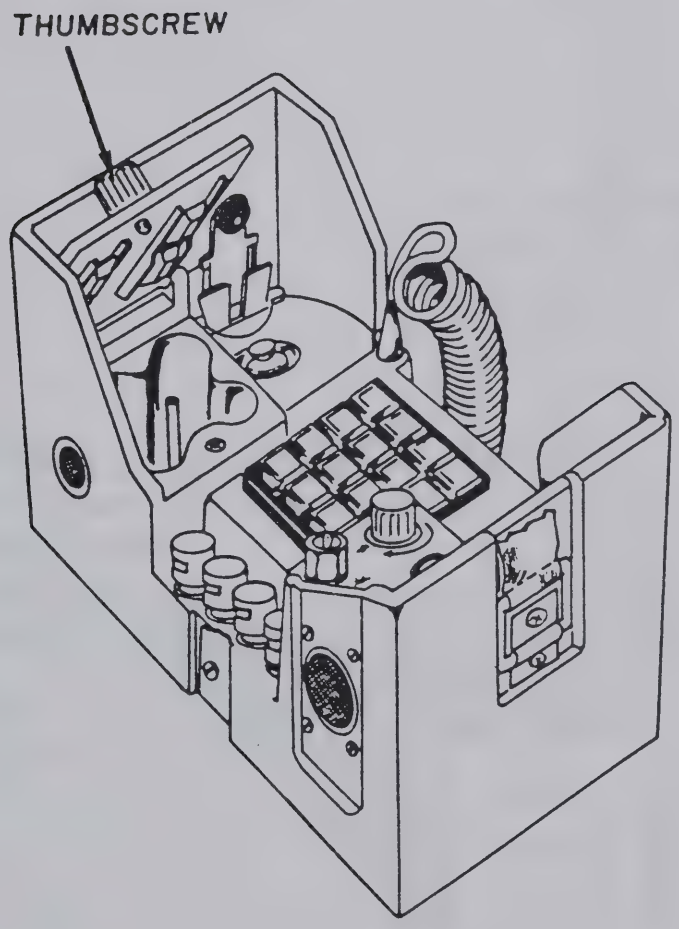
ITEM NO.	INTERVAL B	D	A	W	M	ITEMS TO BE INSPECTED	PROCEDURES	FOR READINESS REPORTING, EQUIPMENT IS NOT READY, AVAILABLE IF:
5		•				OPERATIONAL CAPABILITIES	WHEN USING THE TELEPHONE SET, CHECK TO SEE THAT IT OPERATES PROPERLY	PHONE DOES NOT WORK WHEN PROPERLY CONNECTED (REFER TO PARAGRAPH IN SECTION III, CH. 2, THAT COVERS YOUR TELEPHONE HOOKUP).
6					•	URGENT MWO'S	YOU MUST CHECK WITH C-E ORG MAINTENANCE ONCE A MONTH TO MAKE SURE THAT ALL URGENT MODIFICATION WORK ORDERS (MWO'S) HAVE BEEN DONE ON THE TELEPHONE SET.	C-E ORG MAINTENANCE TELLS YOU THAT ONE OR MORE URGENT MWO'S HAVE NOT BEEN DONE TO YOUR EQUIPMENT.

Section III. OPERATION UNDER USUAL CONDITIONS

2-16. BATTERY INSTALLATION

STEP (1) Turn the thumbscrew counterclockwise to unlock the battery compartment cover.

Swing the cover open.



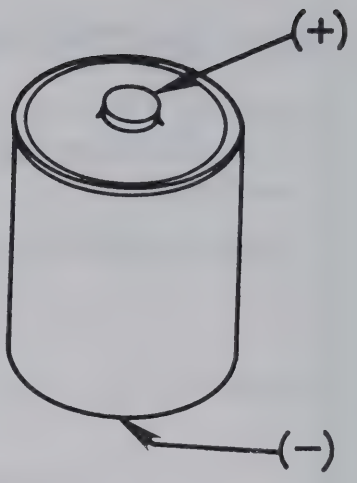
STEP (2) Insert the 4 batteries with the polarity as shown.

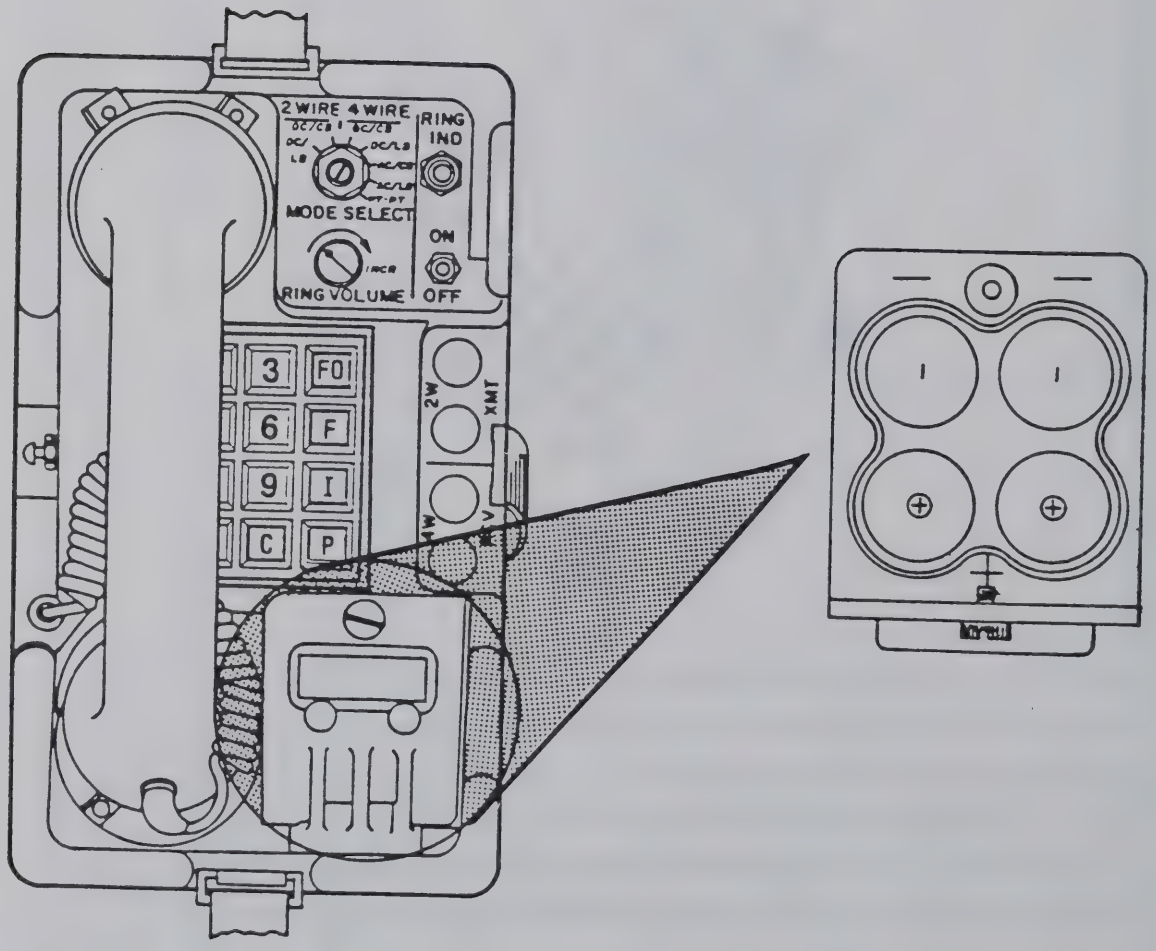
Cell polarity is as follows:

The top of a cell with the button is the (+)

and

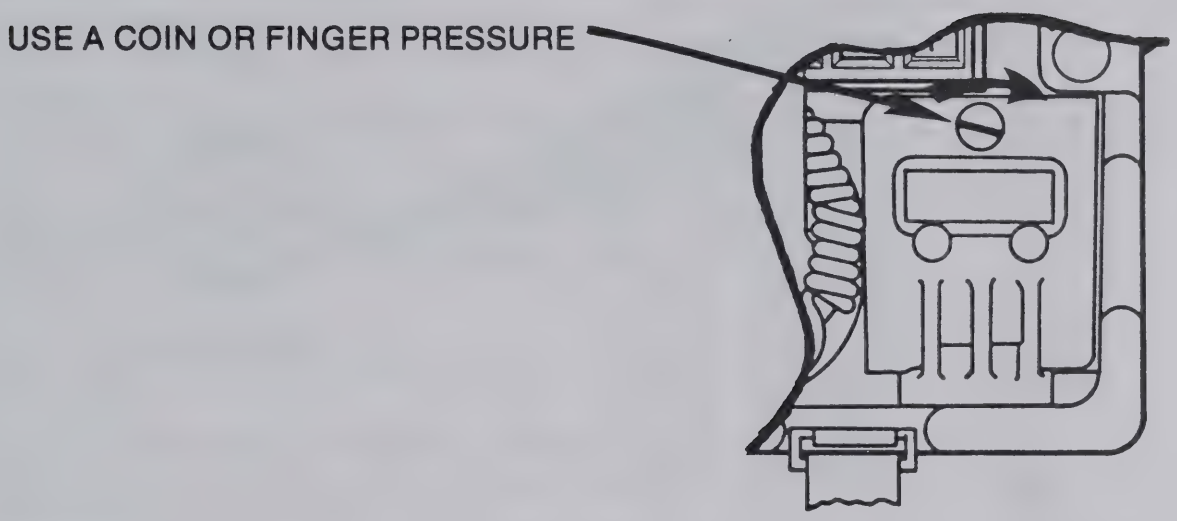
the bottom of the cell that is flat is the (–)





STEP (3) Visually double check the polarity of the 4 cells.

Carefully close the battery compartment cover and lock it. Turn the thumbscrew clockwise.



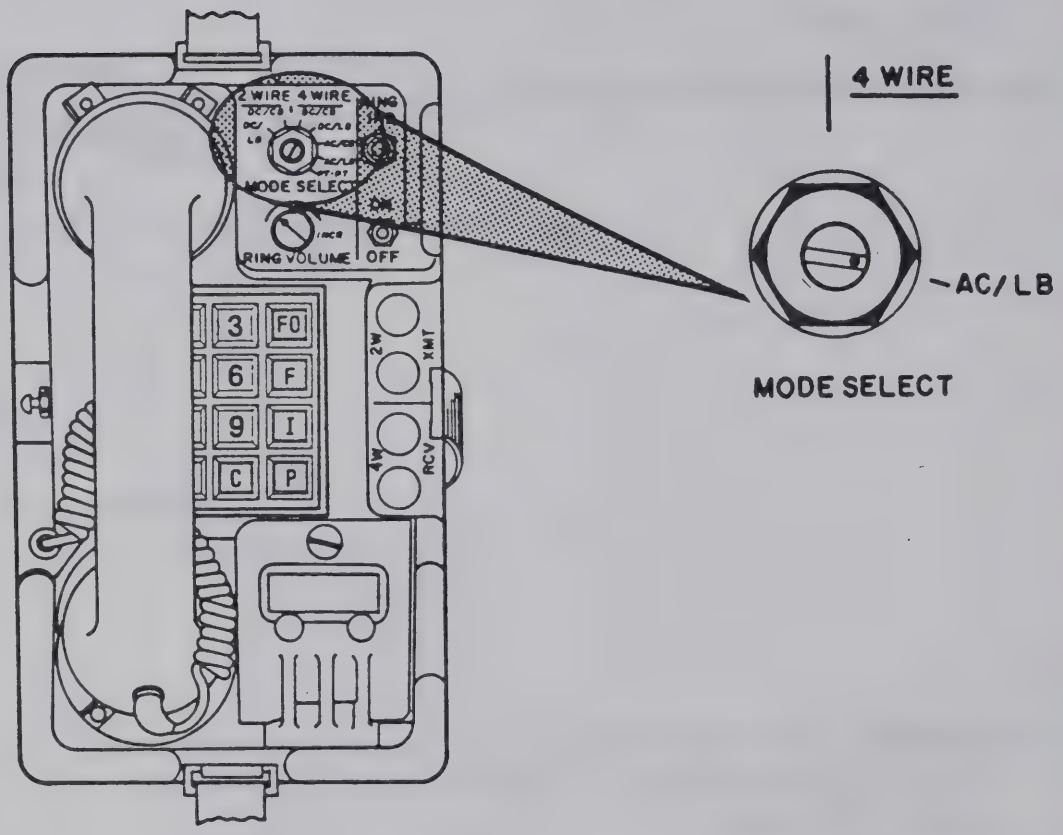
NOTE: In the installation steps that follow, connector blocks should be used wherever it is necessary to minimize strain on connecting wires.

The use of connector blocks, wire laying and tying techniques are covered in the appropriate field and technical manuals.

2-17. STANDARD PREINSTALLATION CHECK

NOTE: This check is made without any wire connections to the telephone set.

STEP (1) Set the **MODE SELECT** switch to **AC/LB.** Use a screwdriver or a coin.



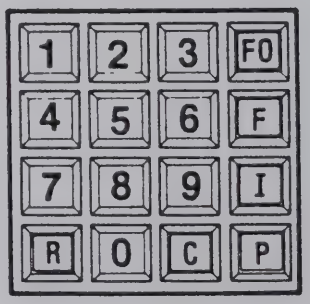
STEP (2) Unlatch the tie down strap and lift the handset off-hook.

Speak into the microphone and listen for sidetone.

You should hear very low level sidetone or no sidetone at all.

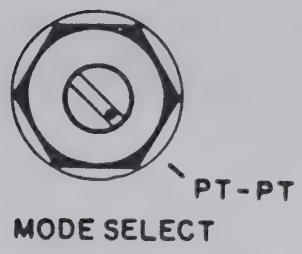
STEP (3) Depress each of the 16 keys on the keyset — one at a time.

The sound level (if any) of each key tone should be very low.



STEP (4) Place the handset on-hook.

STEP (5) Set the **MODE SELECT** switch to **PT-PT**

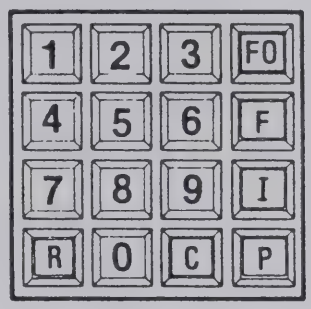


STEP (6) Lift the handset off-hook and speak into the microphone. Wait at least four seconds before speaking.

Listen for your sidetone level. It should be normal sidetone.

STEP (7) Depress each of the 16 keys on the keyset-one at a time.

The sound level of each key tone you hear should be a little lower than sidetone level of your voice.



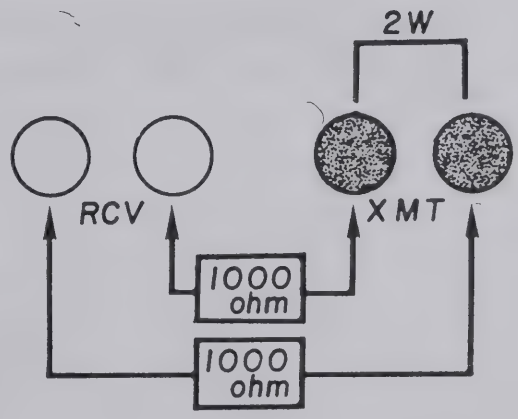
STEP (8) Place the handset on-hook.

NOTE: Make sure the resistor available for the next step have long enough leads or that clip leads are handy to make the necessary connections.

STEP (9) Depress each binding post until its slot is visible and place one 1000 ohm resistor between one **XMT** black binding post and one **RCV** red binding post.

Release the binding post to secure the resistor.

Then place another 1000 ohm resistor between the other **XMT** and **RCV** binding posts.



STEP (10) Lift the handset off-hook and speak into the microphone.

Listen for your sidetone level. You voice sidetone (if any) should be lower than the level you heard in STEP (6).

STEP (11) Depress each of the 16 keys on the Keyset.

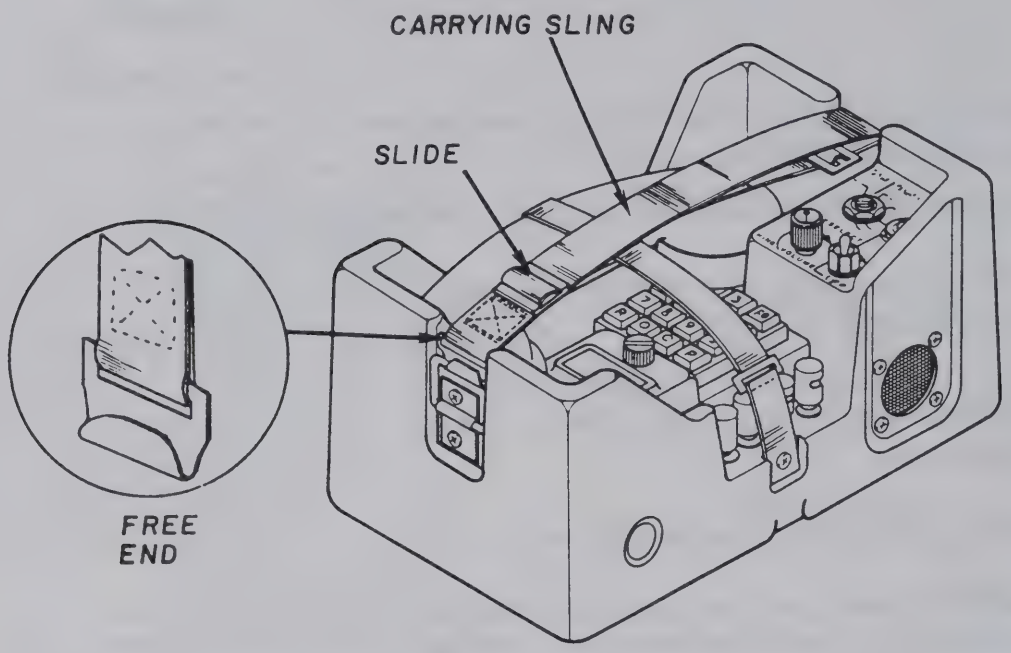
The sound level (if any) of each key tone should be louder than the level you heard in STEP (7).

STEP (12) Place the handset on-hook.

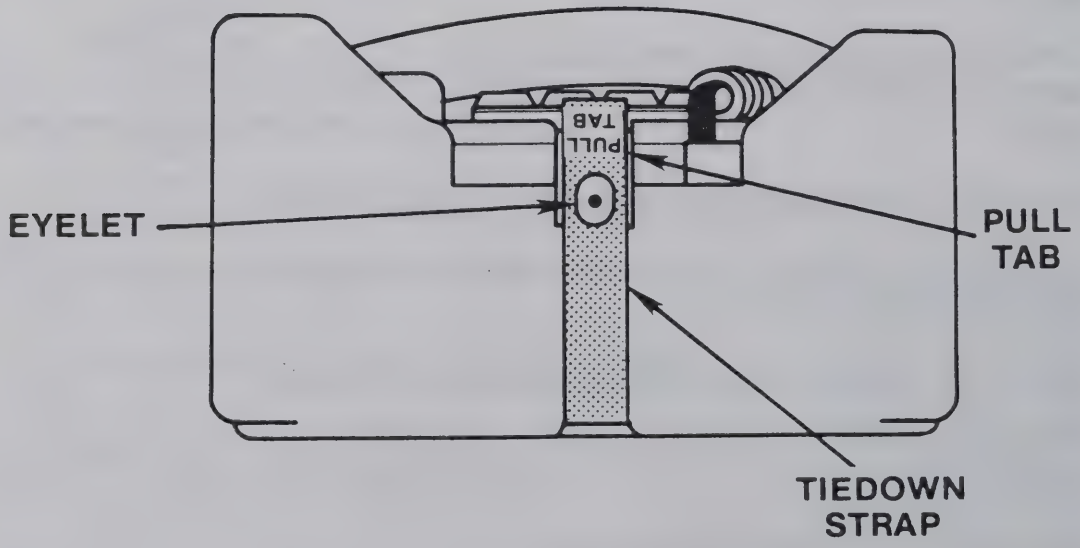
STEP (13) Depress the binding posts and remove two resistors.

2-18. PREPARATION FOR DESK USE

STEP (1) Loosen the carrying sling by moving the slide buckles. Then unhook the lip and place the carrying sling out of the way.

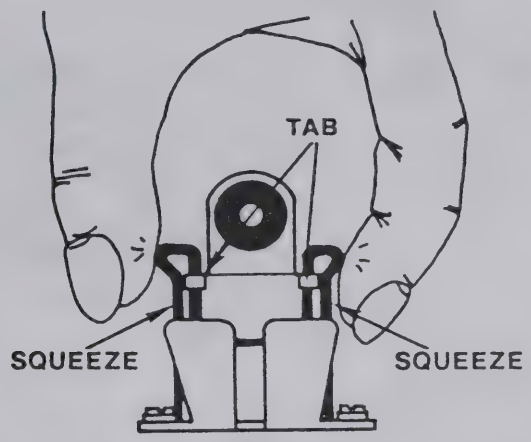


STEP (2) Unsnap the tiedown strap. Adjust its length with the slide buckle so the strap can reach under the case. Place the strap under the case and snap it into place.



STEP (3) Lift the handset and place the handset retaining spring in the latched position (back).

- Squeeze the sides of the spring and move it back behind the two tabs.
- Then release the pressure to keep the spring latched behind the two tabs.
- When latched, the spring cannot hold the handset.



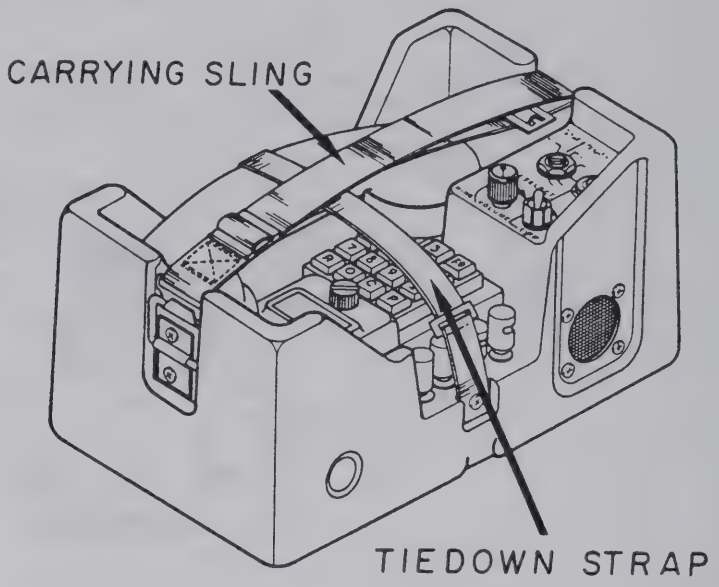
LATCHED

STEP (4) Place the handset on hook.

2-19. VERTICAL MOUNTING OF THE TELEPHONE SET

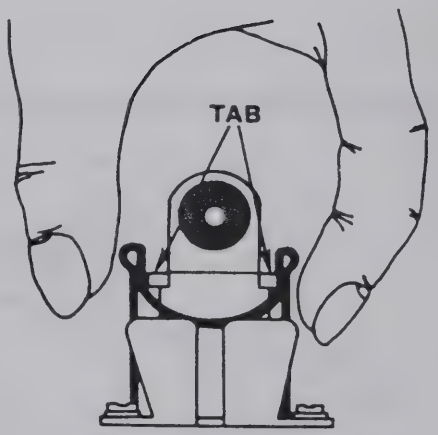
STEP (1) Loosen and lengthen the carrying sling. (Refer to Step (1), para. 2-18)

STEP (2) Loosen and unsnap the handset tiedown strap. (Refer to Step (2), Para. 2-18). Place it under the telephone set and snap it into place.



STEP (3) Place the handset retaining spring in the unlatched position.

- Lift up the handset off-hook
- Squeeze the retaining spring and move it forward past the tabs.
- Place the handset on-hook.



UN-LATCHED

STEP (4) Use the lengthened carrying sling to securely attach the telephone set to a vertical pole or tree.

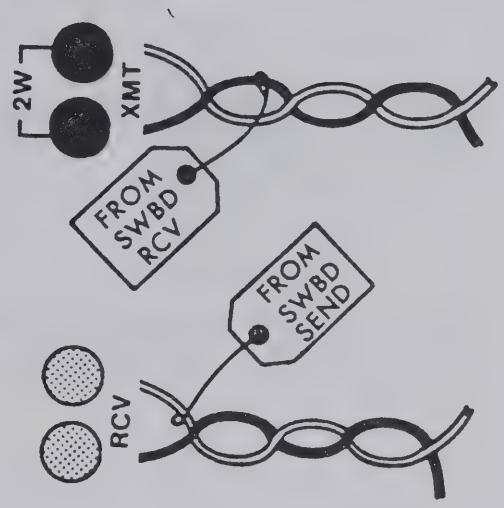
2-20. 4-WIRE SWITCHBOARD CONNECTIONS

CAUTION

DO NOT ATTEMPT TO MAKE ANY 4-WIRE CONNECTIONS IF THE WIRES ARE NOT CLEARLY IDENTIFIED.

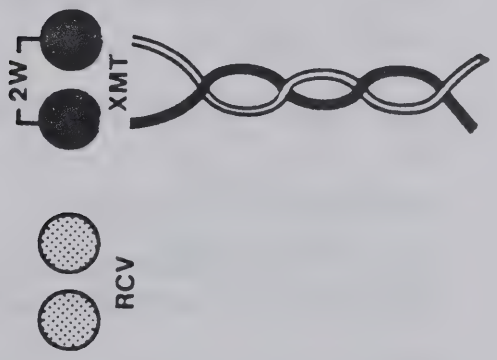
STEP (1) Depress each binding post and connect the wires identified FROM SWBD **RCV** to the telephone set **XMT** black binding posts.

STEP (2) Connect the wires identified FROM SWBD SEND to the telephone set **RCV** red binding posts.



2-21. 2-WIRE SWITCHBOARD CONNECTIONS

STEP (1) Depress each binding post and connect the incoming pair of wires to the **XMT** black binding posts.

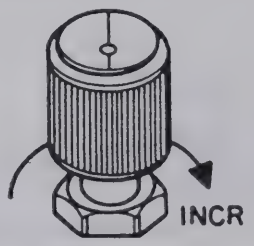


2-22. SWITCHBOARD OPERATION CHECK FOR SB-3614

This check should be made immediately after the telephone set has been connected to the switchboard.

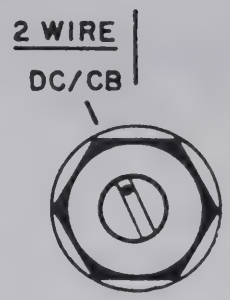
NOTE: The following steps apply only when operating with Telephone Switchboard SB-3614 and AN/TTC-41.

STEP (1) Set the **RING VOLUME** control to mid-range.



RING VOLUME

STEP (2) Make sure that the **MODE SELECT** switch is set to 2-wire **DC/CB.**



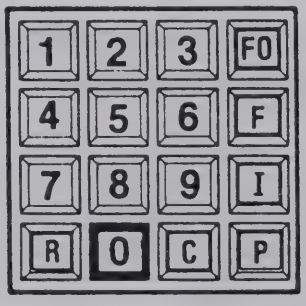
MODE SELECT

Step (3) Lift the handset off-hook and listen for dial tone.

Step (4) After you get dial tone, press digit key [0].

The dial tone should stop.

You should hear a switchboard ring-back tone that pulses in 2 second intervals.



STEP (5) Wait until the tone stops and the switchboard operator answers.

STEP (6) Request the operator dial your number.

STEP (7) Place your handset on-hook.

STEP (8) After the ring, answer the call and establish communications with the operator.

During this step you can adjust the **RING VOLUME** control for the desired ringing level.

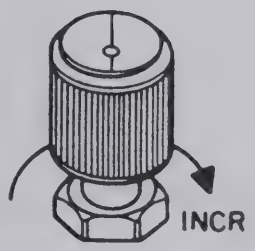
STEP (9) Go on-hook after you are finished.

2-23. SWITCHBOARD OPERATION CHECK FOR AN/TTC-38

This check should be made immediately after the telephone set has been connected to the switchboard.

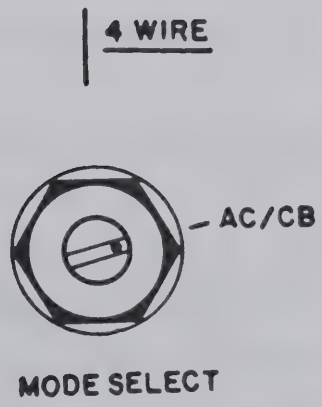
NOTE: The following steps apply only when operating with Automatic Telephone Central Office equipment AN/TTC-38.

STEP (1) Set the **RING VOLUME** control to mid-range.



RING VOLUME

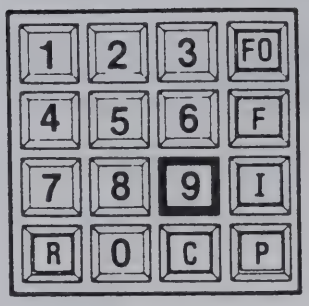
STEP (2) Make sure that the **MODE SELECT** switch is set to **4-WIRE AC/CB**



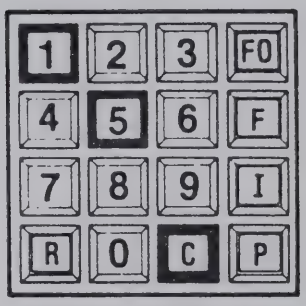
MODE SELECT

STEP (3) Lift the handset off-hook and listen for dial tone.

STEP (4) After you received dial tone: press digit key [9] and dial tone should stop.



STEP (5) Now press digit key [5], then [1] and then [C].



STEP (6) Go on-hook and wait for your phone to ring.

STEP (7) Your telephone set ringer should sound to indicate priority call (one second on, one second off) for ten seconds.

During this step you can adjust the **RING VOLUME** control for the desired ringing level.

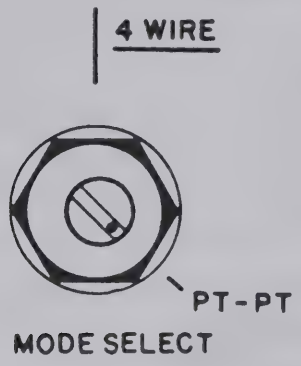
STEP (8) Go off-hook and listen for dial tone.

STEP (9) When you received dial tone, go on-hook.

NOTE: Paragraphs 2-22 and 2-23 describe switchboard operation checks for two specific switchboards. If different switchboards are used, get specific instructions from your team chief for the switchboard operation check steps you should use.

2-24. 4-WIRE POINT-TO-POINT CONNECTIONS

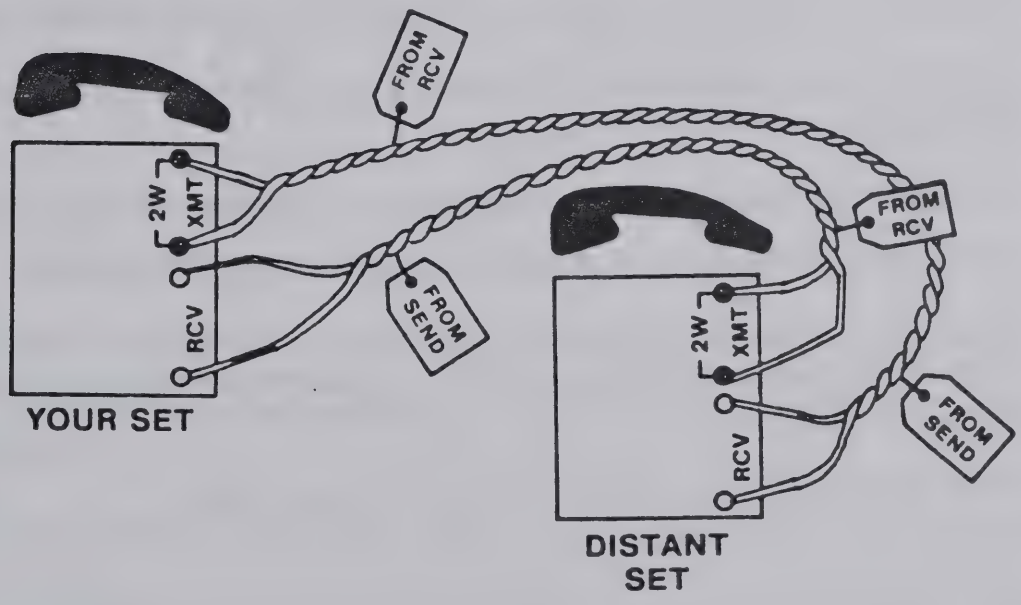
STEP (1) Set **MODE SELECT** switch to **PT-PT.**



STEP (2) At your telephone set connect the wires identified FROM RCV to your **XMT** Black binding posts.

- Depress each binding post.
- Insert the wire.

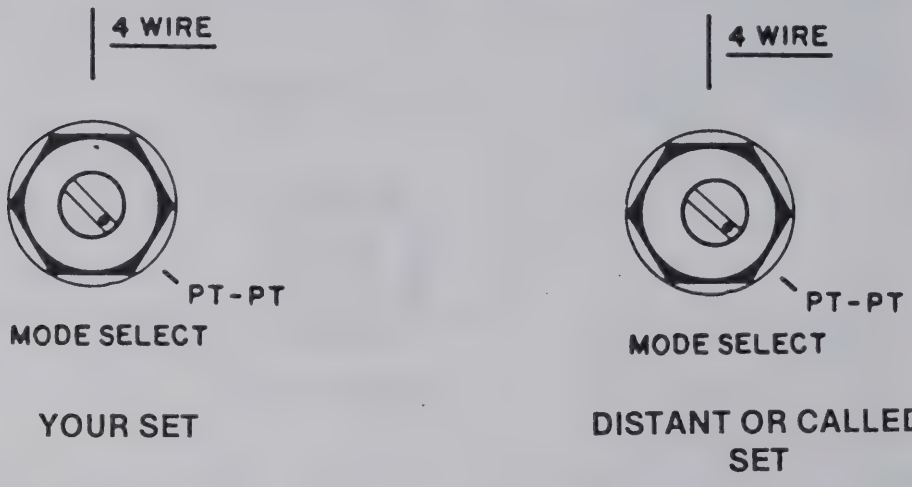
CONNECT the wires identified FROM SEND to your **RCV** red binding posts.



STEP (3) At the distant telephone set, make the same connections as above and make sure the **MODE SELECT** switch is set to **PT-PT.**

2-25. POINT-TO-POINT OPERATIONAL CHECK

STEP (1) Make sure the the **MODE SELECT** switch on each telephone set is set to **PT-PT**



STEP (2) Lift your handset off-hook.

There should be a burst of ringing at the distant (called) telephone set.

STEP (3) When the distant set answers, wait briefly and check for good communications in both directions.

STEP (4) Depress each of the 16 keys on your keyset, one at a time.

Verify that the distant (called) set operator can hear each key tone.

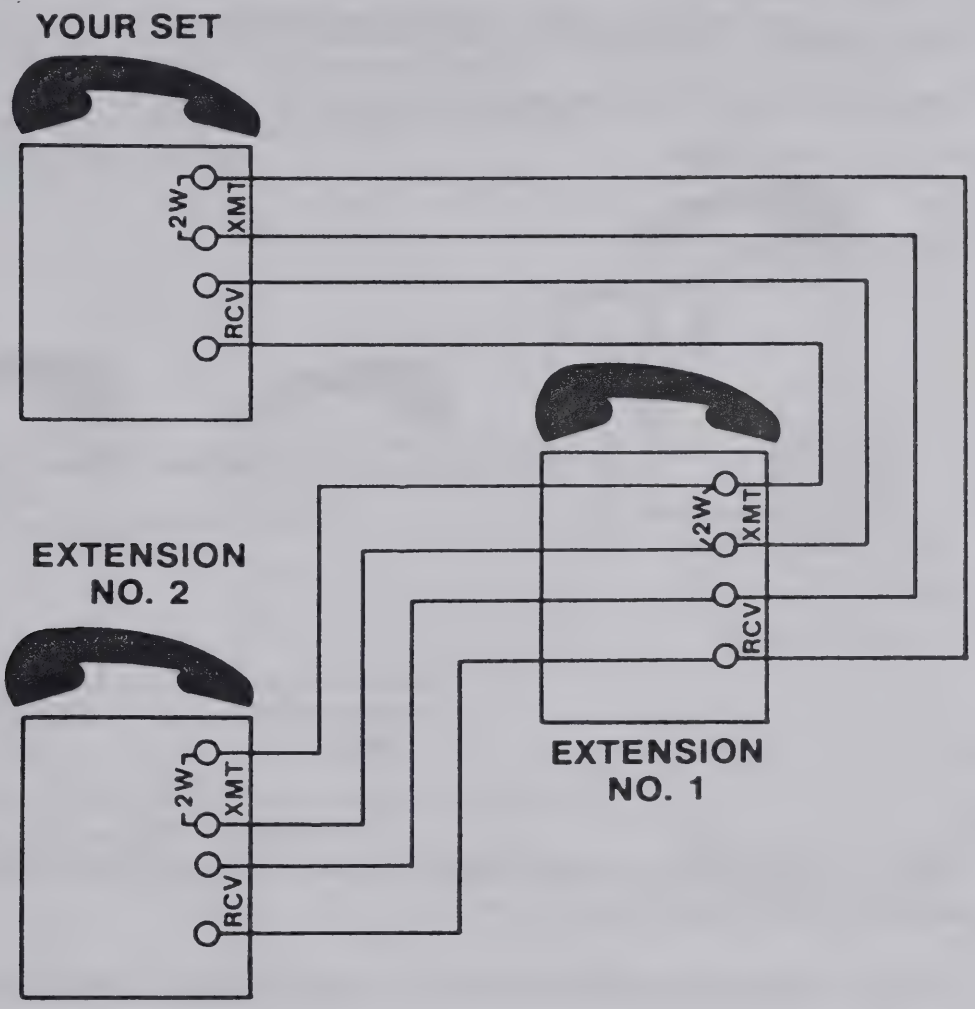
STEP (5) Tell the distant (called) set operator to call you back after you both go on-hook and to repeat STEP (4) and STEP (5) above with your set being the called set.

STEP (6) Go on-hook after completing the above step.

2-26. 4-WIRE EXTENSION CONNECTIONS

One or more extension telephone set may be connected as shown below:

Refer to para 2-24 for details on how to make terminal hook-ups to binding posts.



STEP (1) Make sure the **MODE SELECT** switch on each telephone set is set to the same position.

STEP (2) Make sure every station card is filled out with the assigned number.

STEP (3) Make sure each telephone set has batteries if **4-WIRE DC/LB** or **4-WIRE AC/LB** modes are used.

NOTE: During extension operation, only the last extension line to go on-hook will disconnect the line.

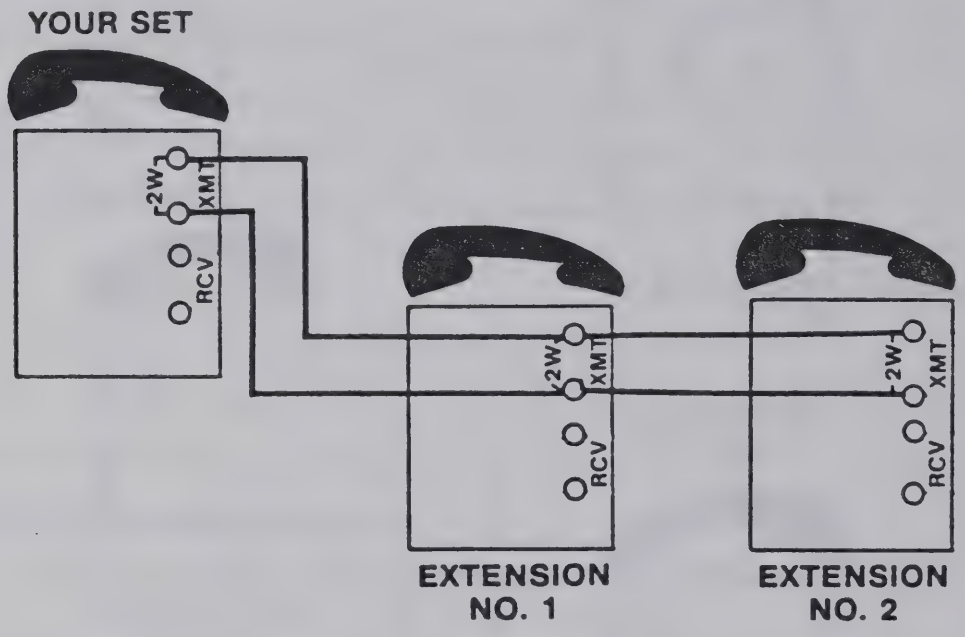
During extension operation, an incoming call will ring all the TELEPHONE SETS.

2-27. 4-WIRE EXTENSION CHECK

Each extension telephone set should be checked out following the steps in Paragraph 2-23.

2-28. 2-WIRE EXTENSION CONNECTIONS

Up to two extension telephone sets may be connected as shown below:



STEP (1) Make sure every **MODE SELECT** switch is set to the same position. Get the information from your team chief.

STEP (2) Make sure each telephone set has batteries if **2-WIRE DC/LB** operation is used.

STEP (3) Make sure every station card is filled out with the assigned number.

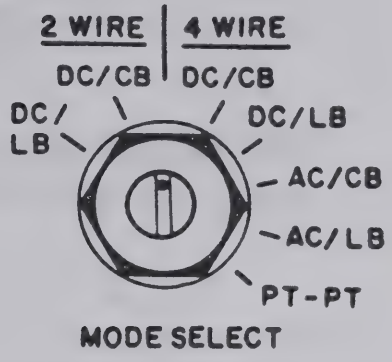
2-29. 2-WIRE EXTENSION CHECK

Each extension telephone set should be checked out following the steps in paragraph 2-22.

NOTE: During extension operation, only the last extension line to go on-hook will disconnect the line.

During extension operation, an incoming call will ring all the telephone sets.

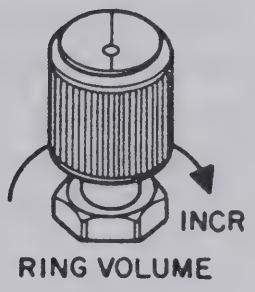
2-30 PLACING AN OUTGOING CALL THROUGH A SWITCHBOARD



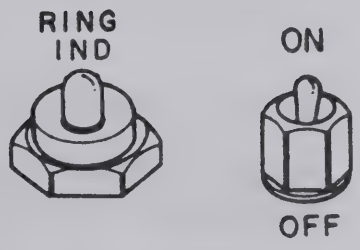
Before placing any calls, make sure that:

- **MODE SELECT** switch is in proper position.

  Your team chief will give you the proper **MODE SELECT** switch position.



- **RING VOLUME** control is set for desired sound level.



- LED **RING IND**icator lamp switch is set to desired **ON** or **OFF** position.

NOTE: Do not depress any priority key if your telephone set has not been assigned a priority.

If you try to use a priority for which you are not authorized, your call will be processed only at the authorized priority, or as routine if you have no priority authorized.

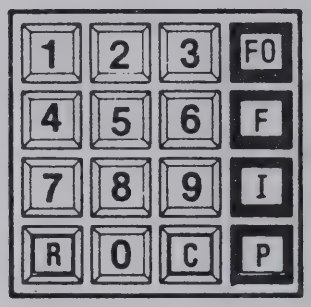
STEP (1) Lift the handset off-hook and listen for dial tone.

STEP (2) If you want to use the priority capability of your set, depress the proper priority key [P] or [I] or [F] or [FO] .

Skip this step if your telephone set does not have a priority assigned or if you do not want to make a priority call. Your call will then be processed as routine.

STEP (3) Carefully, press and release the digit keys for the telephone number you want.

If you realize that you made a mistake, immediately place the handset on-hook, then start over, with STEP (1).



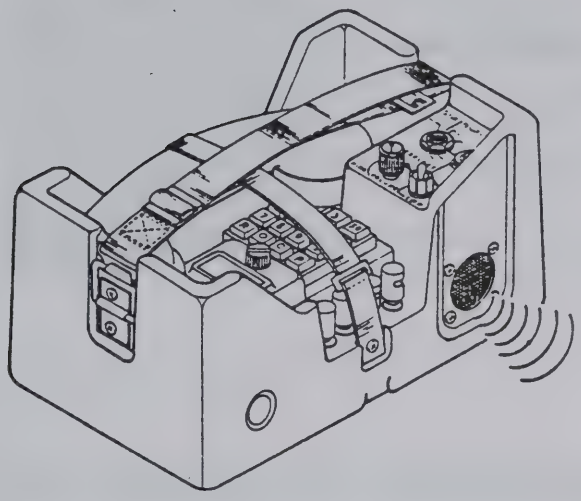
STEP (4) After you finish entering the desired number, you should hear a ringback tone signal.

- An interrupted tone, 2 seconds on and 4 seconds off, when in use with the AN/TTC-38(V) or AN/TTC-39(V).
- A steady tone, 2 seconds on and 2 seconds off when in use with the SB-3614 or AN/TTC-41(V).

or

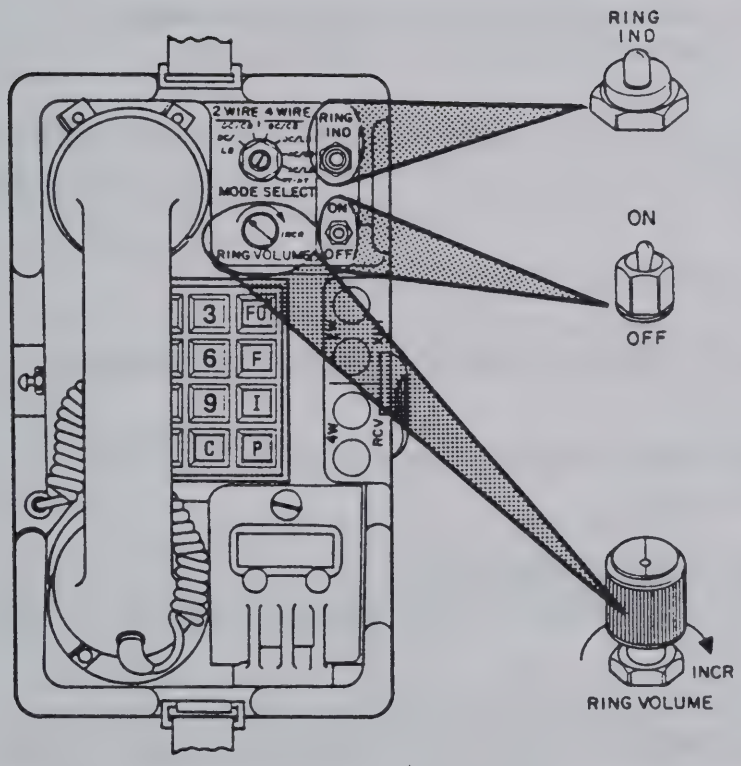
- A busy tone signal.

2-31. RECEIVING AN INCOMING CALL



The ringback tone signal will activate:

- The tone ringer.
  The loudness is controlled by your **RING VOLUME** control.



- The **LED RING IND**icator lamp to glow if the **ON-OFF** switch is at ON.

To answer the call:

STEP (1) Lift your handset off-hook and speak into the microphone.

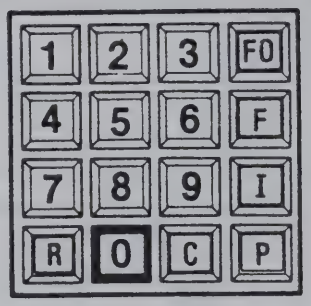
STEP (2) When you are finished, place the handset on-hook.

2-32 CALLING THE SWITCHBOARD OPERATOR

STEP (1) Lift your handset off-hook and listen for dial tone.
STEP (2) After you receive dial tone, carefully depress digit key [0].
STEP (3) You should hear: A ringback tone signal,

or

a busy tone signal.



2-33. PLACING A PREPROGRAMMED CONFERENCE CALL

NOTE: Preprogrammed conference calls are usually available whe the telephone set is connected to Automatic Telephone Central Office equipment AN/TTC-38(V) or AN/TTC-39(V).

Before placing a preprogrammed conference call ask your team chief for the assigned preprogrammed conference call telephone number and for any other special instructions.

STEP (1) Lift the handset off-hook and listen for dial tone.

STEP (2) If you want to use the priority capability of your telephone set:
- Depress the proper priority key

Skip this step if your telephone set does not have a priority or if you do not want to make a priority conference call.

STEP (3) Depress conference key [C] and then,
- Depress the digit keys - one at a time - for the assigned preprogrammed conference call number you want.

The desired conference call will be automatically setup by the switchboard.
- If you should receive a busy signal, instead of the desired conference call:

Place the handset on-hook and try placing the preprogrammed conference call a few minutes later.

At the end of the preprogrammed conference call, all parties should go on-hook.

2-34. PLACING A PROGRESSIVE CONFERENCE CALL

NOTE: Progressive conference calls are usually available when the telephone set is connected to Automatic Telephone Central Office equipment AN/TTC-38(V) or AN/TTC-39(V). The number or parties that can be connected in a progressive conference call depends on the switchboard used with your telephone set.

Before placing a progressive conference call, make sure that you have handy all of the telephone numbers of the parties you want in on the call.

STEP (1) Lift your handset off-hook:
- Listen for dial tone.

STEP (2) If you want to use the priority capability assigned to your telephone set,:
- Depress the proper priority key. Skip this step if your set does not have a priority or you do not want to place a priority conference call.

STEP (3) Depress conference key [C].

and

- Wait for a second dial tone.

STEP (4) Depress the digit keys - one at a time - for the number of the first party in the conference call.

STEP (5) After you finish entering the numbers, you should hear:
- A ring back tone signal,

or

- a busy tone signal.

STEP (6) IF you hear a ringback tone signal:
- Wait until the tone stops and the called party answers.
- When the called party answers, tell the party to standby while you call the other numbers in your conference.
- Then proceed to call the other following STEPS (3), (4), (5) and (6) above.

IF you hear a busy tone signal or, if the called party does not answer:
- Depress key [R] to release the line.
- Conduct your conference call with the parties available, or reschedule the conference call.

2.35. PLACING AN OPERATOR ASSISTED CONFERENCE CALL

NOTE: Whenever your telephone set is connected to a switchboard that does not have automatic conference circuits, you must use the switchboard operator to setup a conference call. This applies to several switchboards including the SB-3614 and AN/TTC-41(V).

Before asking the operator to setup a conference call, make sure that you have handy all of the telephone numbers of the parties you want in on the call.

STEP (1) Lift your Handset off-hook and listen for dial tone.

STEP (2) After you receive dial tone, depress key [0].

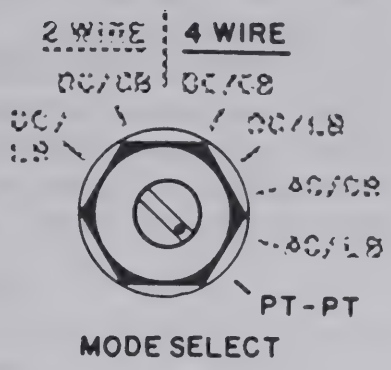
STEP (3) When the operator answers, give the operator the telephone numbers of the parties you want in on the conference call.

STEP (4) Follow the operator's instructions and complete your conference call.

STEP (5) At the end of the conference call, all parties should go on-hook.

2-36. PLACING A POINT-TO-POINT OUTGOING CALL

Make sure that the **MODE SELECT** switch is set to **PT-PT**.



STEP (1) Lift the handset off-hook.

- This will cause your telephone set to send one burst of ringing tone to the distant set.
- If there is no answer, go on-hook then back to off-hook.

  This will send another burst of ringing tone to the distant set. Repeat this until you reach the called party or you are satisfied no one is available to answer your call.

STEP (2) If connection is established, both parties should go on-hook after the call is completed.

2-37. RECEIVING AN INCOMING POINT-TO-POINT CALL

STEP (1) Your telephone set will signal you by:

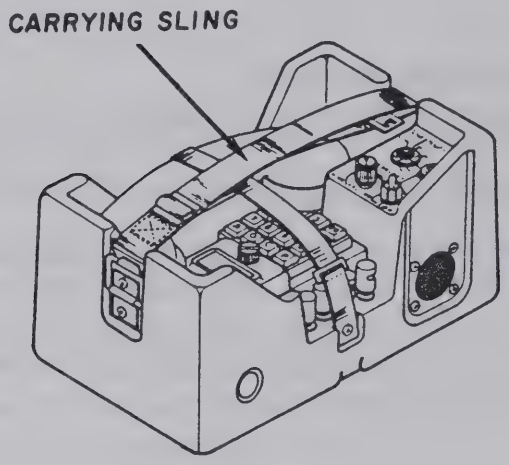
- A momentary burst of sound from the tone ringer.
- A momentarily lighted **LED RING IN**Dicator (if you have your **ON-OFF** switch set to **ON).**

STEP (2) If connection is established, both parties should go on-hook after the call is completed.

2-38. PREPARATION FOR MOVEMENT

The following are steps for routine movement:

- Remove the batteries.
- Disconnect all wires at **RCV** and **XMT** binding posts.
- Disconnect all wires from connector block to the telephone set.
- Use the tiedown strap to secure the handset.
- For carrying purposes, adjust the carrying sling to a convenient length.
- For storage or shipment, adjust the carrying sling to the shortest possible length.



SECTION IV. OPERATION UNDER UNUSUAL CONDITIONS

2-39. COLD WEATHER OPERATION

Low temperatures will:

- decrease battery effectiveness.
- cause the retractile cords, rubber and plastic parts to become stiff and sometimes brittle.

Keep the telephones set as protected as possible.

Use screens, boxes or any other practical means to keep the cold and wind away from the telephone set.

Use battery type BA-3042/U during operation in extreme cold.

Keep an extra set of batteries in a warm place. Your pockets are a good place.

WARNING

NEVER HEAT ANY BATTERIES WITH DIRECT HEAT. NEVER PLACE THEM ON A STOVE. THEY MAY EXPLODE OR YOU MAY DAMAGE THE BATTERY.

Use a microphone shield to help prevent moisture from icing up on the microphone of your HANDSET.

If no microphone shield is available, try using a clean dry cloth over the microphone.

Ask C-E org maintenance to order and install a microphone shield. Authorization and identifying data are included in TM 11-5805-650-20P.

2-40. OPERATION IN HOT-DRY CLIMATE

The telephone set should be protected from dirt, dust and strong sunlight.

Locate the telephone set in a shaded area.

Clean and dust the set as needed.

CAUTION

DO NOT USE SOLVENTS TO CLEAN ANY PART OF THE TELEPHONE SET.

2-41. OPERATION IN WARM AND DAMP CLIMATE

The telephone set should be protected from moisture and fungus.

Clean the outside of the set with a clean, lint-free cloth as needed.

2-42. OPERATION IN NOISY AREAS

When operating in a noisy area, shield the microphone from the noise source with your hand or body.

Speak loudly, clearly and slowly into the microphone.

2-43. EMERGENCY PROCEDURES

If a 4-WIRE circuit goes out, it may be possible to hookup a 2-WIRE circuit.

Get specific instructions from your team chief.

CAUTION

NEVER TRY TO MAKE AN EMERGENCY HOOKUP WITHOUT THE APPROVAL OF YOUR TEAM CHIEF.

CHAPTER III
OPERATOR/CREW MAINTENANCE

Section I. TROUBLESHOOTING PROCEDURES

3-1. TROUBLESHOOTING GUIDELINES

The simple and rugged construction of the telephone set reduces troubleshooting and maintenance procedures.

The following table covers the troubleshooting steps you should follow if there is a communications failure. If your trouble cannot be corrected, notify C-E org maint.

CAUTION

THE OPERATOR IS ONLY AUTHORIZED TO OPEN THE BATTERY COMPARTMENT. THE OPERATOR IS NOT AUTHORIZED TO OPEN UP THE SET FOR ANY OTHER REASON OR TO MAKE ANY INTERNAL CHECKS, ADJUSTMENTS OR REPAIRS.

The following table does not cover troubleshooting the wire, cable and switchboard equipment and circuits. Follow the instructions in the applicable field and technical manuals to troubleshoot these items.

TABLE 3-1 TROUBLESHOOTING

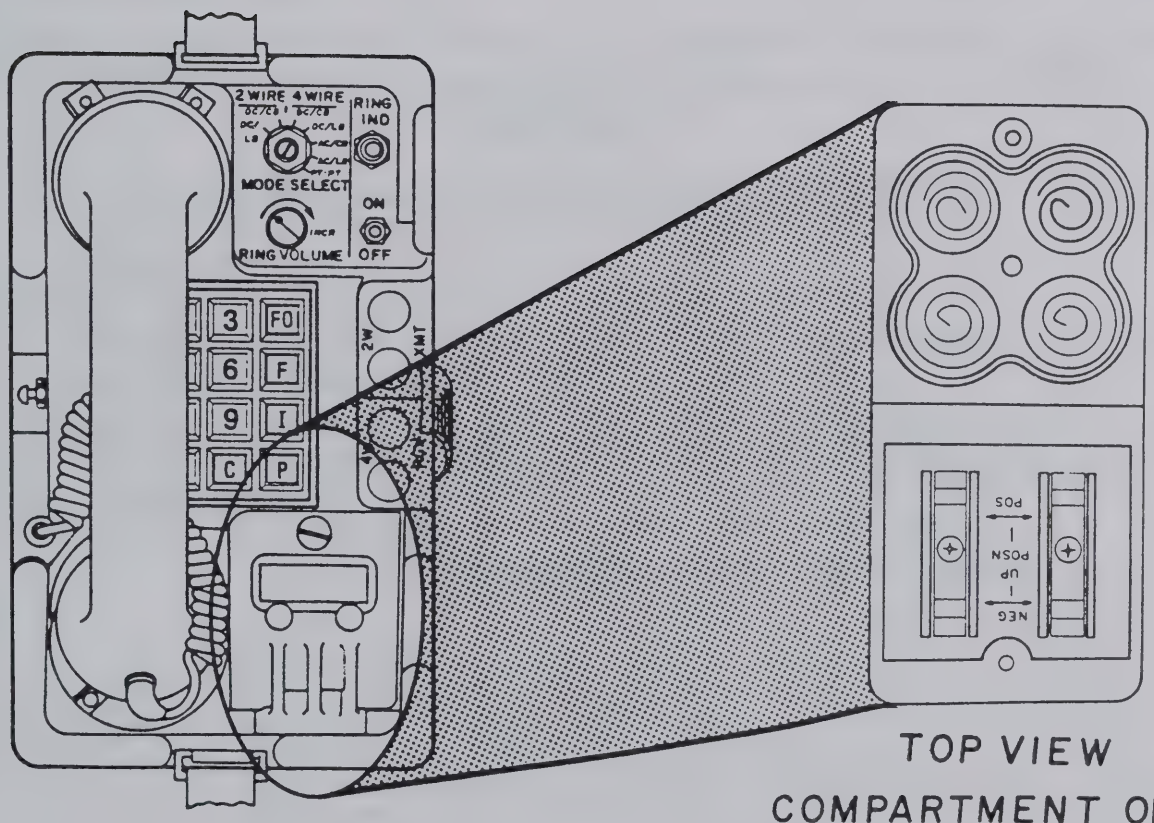
TROUBLE Test or Inspection	• *Corrective Action*
1. NO RINGING OR LOW VOLUME	
Step ① Check setting of RINGER VOLUME control.	• ***Adjust to proper position (turn clockwise to increase volume).***
Step ② Check for weak batteries.	• ***Replace batteries.***
Step ③ Substitute a know good set.	• ***Replace your set if known good set works.***
2. YOU CAN HEAR CALLING PARTY, THEY CANNOT HEAR YOU	
Step ① Check hook-up	• ***Make proper connections at binding posts.***
Step ② Check for weak batteries.	• ***Replace batteries.***
Step ③ Substitute a known good set.	• ***Replace your set if known good set works.***

SECTION II. MAINTENANCE PROCEDURES

3-2. AUTHORIZED MAINTENANCE PROCEDURES

The operator is only authorized to:

- Open up the battery compartment to inspect, clean, and remove or replace batteries.
- Connect and operate the telephone set.



TOP VIEW
COMPARTMENT OPEN

3-3. AUTHORIZED CLEANING PROCEDURES

CAUTION

DO NOT USE SOLVENTS TO CLEAN ANY PART OF THE TELEPHONE SET.

Cleaning can be done using:

- A clean dry cloth or soft brush

  or

  a clean cloth moistened with clear water. Dry the set thoroughly using a clean dry cloth.
- Dry compressed air, not to exceed 29 pounds per square inch, to remove dust and dirt from hard to reach places.

WARNING

COMPRESSED AIR SHALL NOT BE USED FOR CLEANING PURPOSES EXCEPT WHERE REDUCED TO LESS THAN 20 PSI AND THEN ONLY WITH EFFECTIVE CHIP GUARDING AND PERSONNEL PROTECTIVE EQUIPMENT. DO NOT USE COMPRESSED AIR TO DRY PARTS WHEN **TRICHLORO-TRIFLUOROETHANE** HAS BEEN USED. COMPRESSED AIR IS DANGEROUS AND CAN CAUSE SERIOUS BODILY HARM IF PROTECTIVE STEPS ARE NOT TAKEN TO PREVENT CHIPS OR PARTICLES (OF WHATEVER SIZE) FROM BEING BLOWN INTO THE EYES OR UNBROKEN SKIN OF THE OPERATOR OR OTHER PERSONNEL.

CHAPTER IV
ORGANIZATIONAL MAINTENANCE

Section I. REPAIR PARTS, SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

4-1. COMMON TOOLS

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

4-2. TMDE, SPECIAL TOOLS AND SUPPORT EQUIPMENT.

Refer to the Maintenance Allocation Chart (MAC) Appendix B in the back of this manual.

4-3. REPAIR PARTS

Repair parts are listed and illustrated in the repair parts and special tools list in TM 11-5805-650-20P covering organizational maintenance for this equipment.

Section II. ORGANIZATIONAL PMCS

4-4. GENERAL

To be sure that your equipment is always ready for your mission, you must do scheduled monthly and quarterly PMCS.

Use the item no. in your PMCS table to get the numbers for the TM item no. column of DA Form 2404 (Equipment Inspection and Maintenance Worksheet) when you fill out the form.

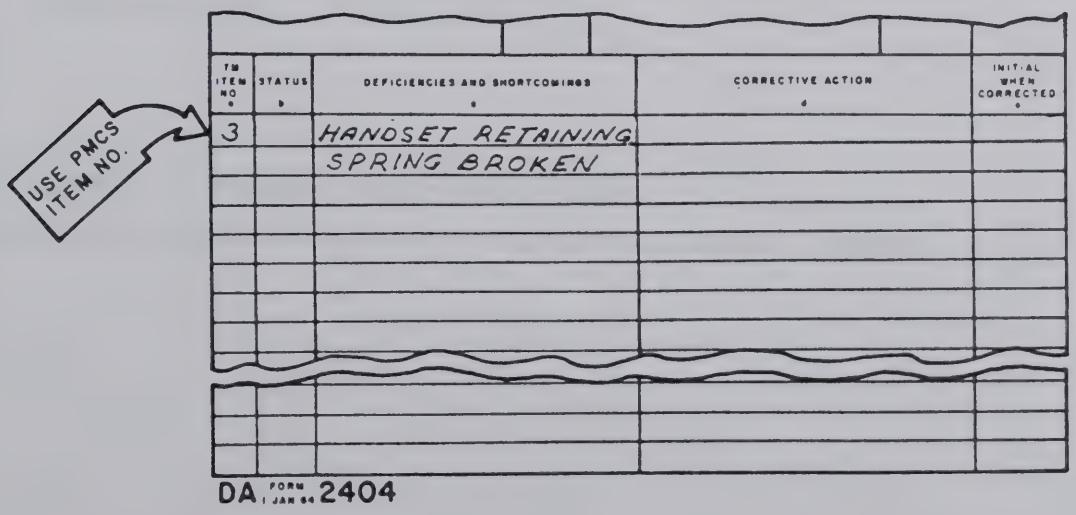


TABLE 4-1 ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES

M = MONTHLY **Q** = QUARTERLY

ITEM NO.	INTERVAL M	INTERVAL Q	ITEM TO BE INSPECTED	PROCEDURES
1	•		COMPLETENESS	ALL COMPONENTS REQUIRED TO MAKE THE TELEPHONE SETS OPERATIONAL ARE ON HAND.
2	•		OPERATIONAL CAPABILITY	PERFORM THE INSTALLATION CHECK PROCEDURES, PARA. 2-17, 2-22, AND 2-23.
3	•		HANDSET RETAINING SPRING	CHECK FOR BENT OR BROKEN SPRING. REPLACE IF NECESSARY, PARA. 4-11.
4	•		MODIFICATIONS	CHECK DA PAM 310-1 TO SEE IF ANY MODIFICATION WORK ORDERS (MWO's) ARE LISTED. ALL URGENT MWO'S MUST BE APPLIED IMMEDIATELY AND ALL NORMAL MWO'S MUST BE SCHEDULED.
5		•	STRAP AND SLINGS	CHECK FOR FRAYING AND SIGNS OF WEAR. REPLACE IF NECESSARY.
6		•	PUBLICATIONS	MAKE SURE NECESSARY TECHNICAL MANUALS ARE ON HAND.

Section III. TROUBLESHOOTING

4-5. GENERAL

Organizational maintenance troubleshooting procedures are the same as those authorized for the Operator/Crew in paragraph 3-1 and TABLE 3-1.

Section IV. MAINTENANCE PROCEDURES

4-6. AUTHORIZED ORGANIZATIONAL MAINTENANCE PROCEDURES

Organizational maintenance is only authorized to remove and replace the following items:

- Carrying sling including screws, washers, loop retainer plates and loop retainers.
- Tiedown strap including screws and washers.
- Microphone shield.
- Handset retaining spring including screws, flat washers, lock washers, and brackets.
- Binding post covers.
- Volume control knob.

CAUTION

DO NOT ATTEMPT ANY OTHER MAINTENANCE PROCEDURES ON THE TELEPHONE SET.

4-7. REPAINTING AND REFINISHING

No painting or refinishing is authorized for the case and handset.

4-8 . ORGANIZATIONAL MAINTENANCE CLEANING PROCEDURES.

Organizational maintenance cleaning procedures are the same as those authorized for the Operator/Crew in paragraph 3-3.

Keep in mind the following warning and caution.

WARNING

COMPRESSED AIR IS DANGEROUS AND CAN CAUSE SERIOUS BODILY HARM. IT CAN ALSO CAUSE MECHANICAL DAMAGE TO THE EQUIPMENT.

CAUTION

DO NOT USE SOLVENTS TO CLEAN ANY PART OF THE TELEPHONE SET.

4-9. REPLACING CARRYING SLING

This task covers removal and replacement.

INITIAL SETUP:

Special Tools: Tool Kit, Electronic, TK-101/G.
Personnel required: 1
Materials/Parts: One carrying sling with necessary hardware.

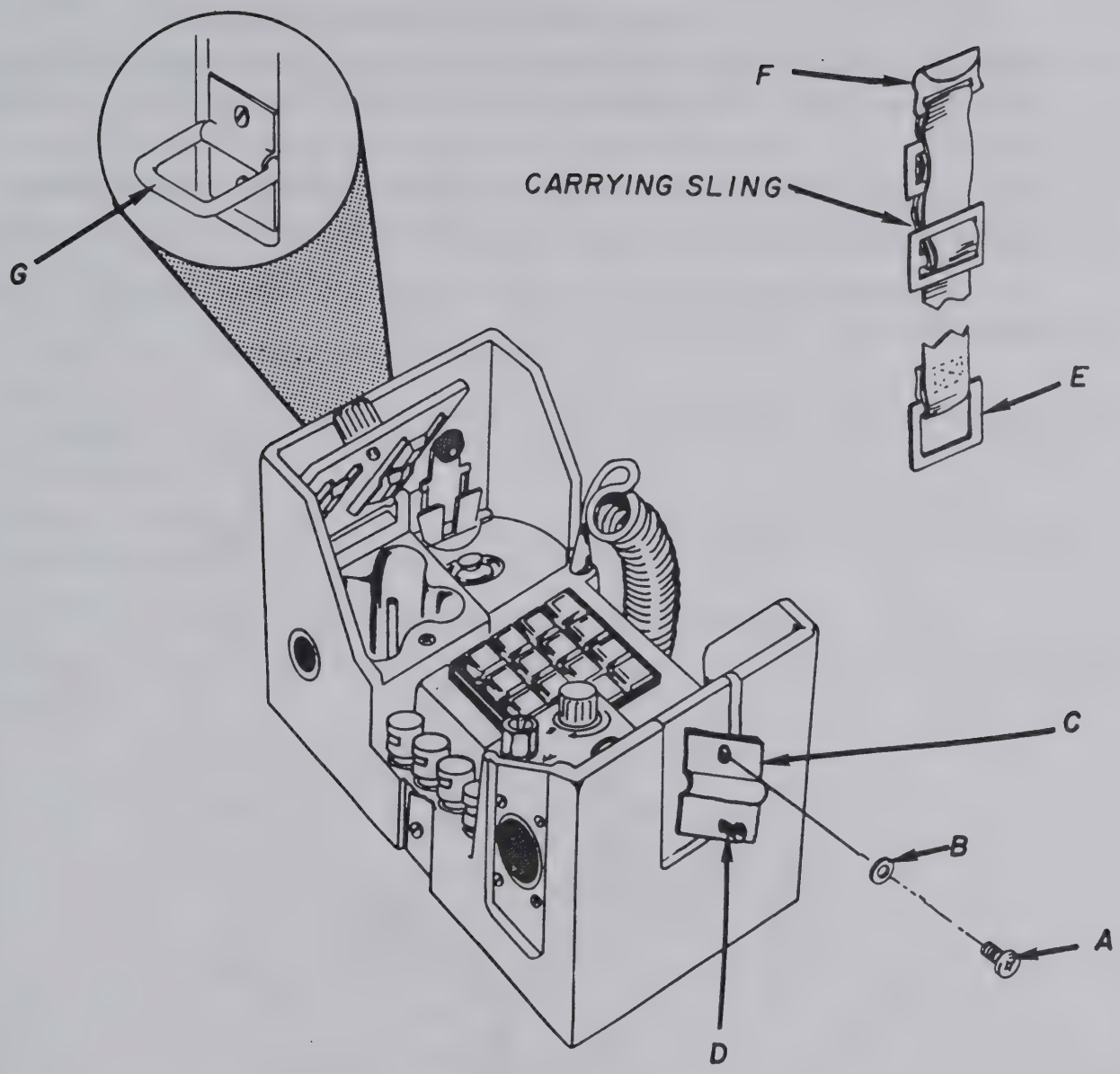
STEP (1) Remove the top Philips screw A (by turning it counter-clockwise) and its washer B from the carrying sling loop retainer plate C.

STEP (2) Loosen the lower Philips screw D (by turning it counter-clockwise) and remove the loop retainer E from the loop retainer place C.

STEP (3) Unclip the lip F from the second loop retainer G and remove and dispose of the old sling.

STEP (4) Position the loop retainer E of the new carrying sling under the loop retainer plate C. Make sure the nomenclature side of the sling is up.

STEP (5) Replace screw A and its washer B. Turn both screw A and screw D clockwise to tighten.


F
CARRYING SLING
E
G
C
B
A
D

4-10. REPLACING TIEDOWN STRAP

This task covers removal and replacement.

INITIAL SETUP:

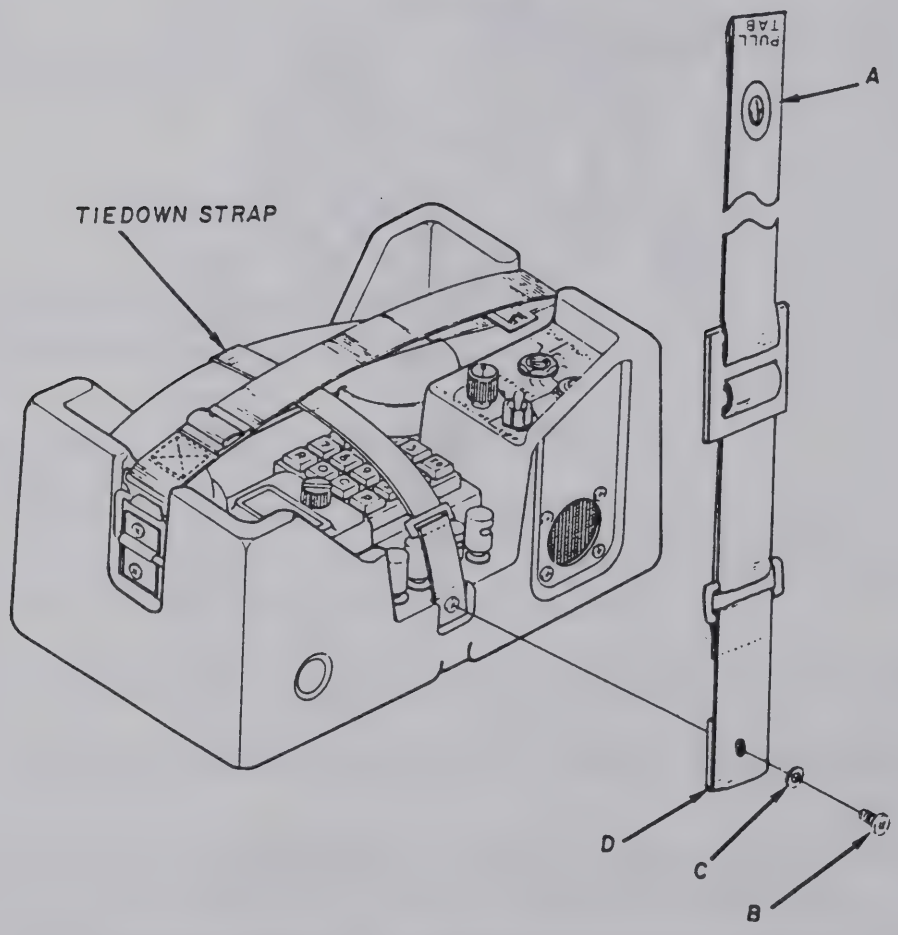
Special Tools: Tool Kit, Electronic, TK-101/G.
Personnel required: 1
Materials/Parts: One tiedown strap with necessary hardware.

STEP (1) Unsnap the top eyelet A from the retaining pin on the other side of the telephone set case. The retaining pin is molded in the case and it cannot be replaced.

STEP (2) Turn slotted screw B counterclockwise to remove tiedown strap.

STEP (3) Position the new tiedown strap bottom eyelet D over the screw hole.

STEP (4) Insert screw B with it's washer C and tighten the screw by turning it clockwise.



4-11. REPLACING THE HANDSET RETAINING SPRING

This task covers removal and replacement.

INITIAL SETUP:

Special Tools: Tool Kit, Electronic, TK-101/G.
Personnel required: 1
Materials/Parts: One retaining spring with necessary hardware.

STEP (1) Place the handset out of the way.

STEP (2) Remove Philips screws A and B (by turning counter-clockwise), lock washers C and D, and their flat washers E and F.

STEP (3) Lift off the retaining spring G with its bracket I.

STEP (4) Remove the retaining spring from the bracket by squeezing the spring, moving it out of the way of the arms of the bracket and separating it from the bracket.

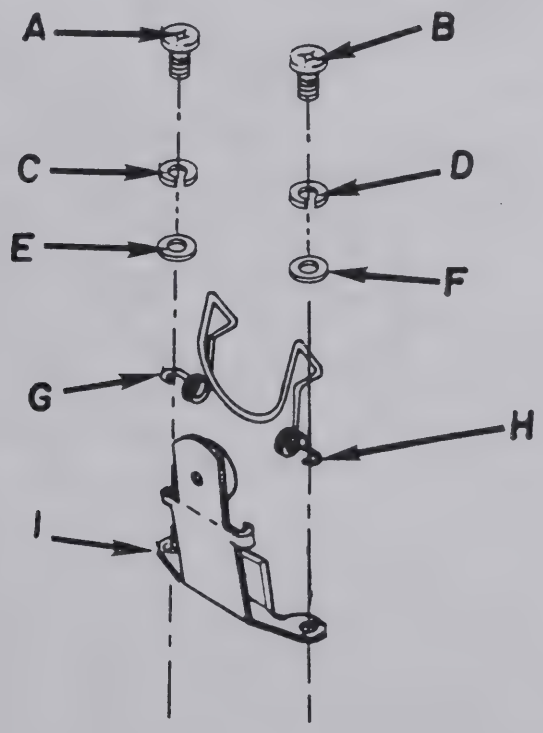
STEP (5) Install a new retaining spring on the bracket, squeezing the retaining spring until it fits between the bracket arms.

STEP (6) Insert screws A and B with their lock washers C and D and their flat washers E and F through retaining spring lugs G and H down through the holes in the bracket.

STEP (7) Position the new retaining spring and its bracket (with the screws and washers attached) on top of the screw holes in the case.

STEP (8) Tighten screws A and B (by turning clockwise).

STEP (9) Place the handset on-hook and check for proper latch and unlatch action.



4-12. REPLACING THE MICROPHONE SHIELD

This task covers removal and replacement.

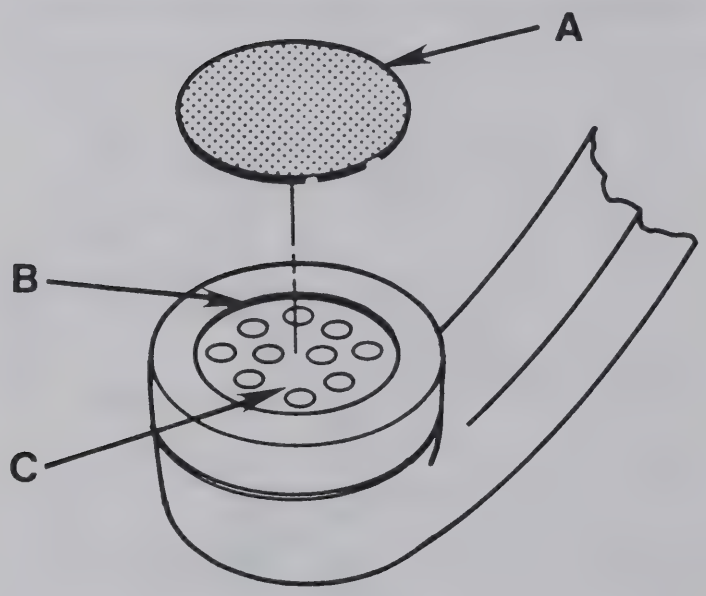
INITIAL SETUP:

Special Tools: None.
Personnel Required: 1
Materials/Parts: One Microphone shield.

STEP (1) Use a small screwdriver or similar instrument to pry off the old microphone shield.

STEP (2) Position the new microphone shield A in the center of the microphone cap C.

STEP (3) APPLY pressure with your thumb until the three ears on the microphone shield are compressed and hold against the recess area B in the microphone cap.



4-13. REPLACING THE VOLUME CONTROL KNOB

This task covers removal and replacement.

INITIAL SETUP:

Special Tools: None
Personnel Required: 1
Materials/Parts: One Volume control knob.

To remove the old volume control knob D:

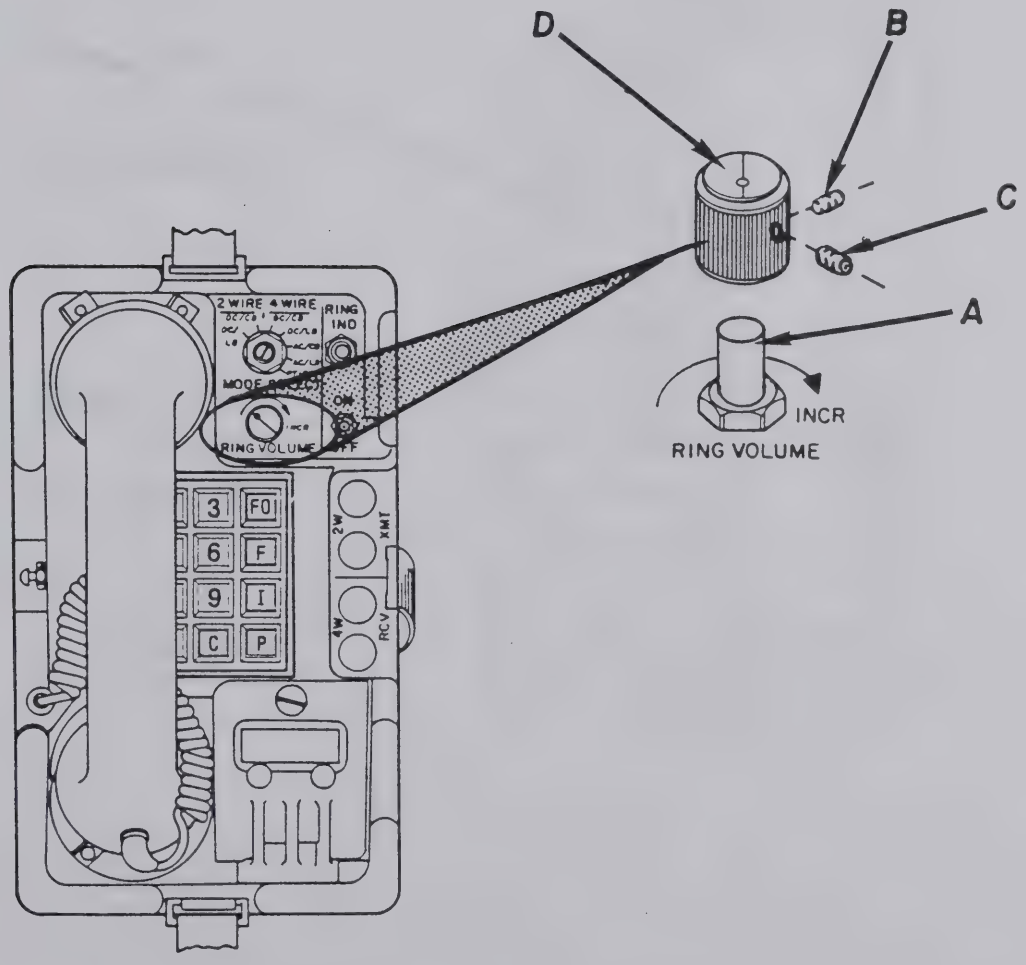
STEP (1) Use a hex wrench (size 1/16″) to loosen the two screws B and C by turning them counter clockwise and pull up on the old knob and remove it.

STEP (2) Back out the two screws of the new knob D until they cannot be seen inside the hole in the knob by turning them counter-clockwise.

STEP (3) Rotate the shaft A, by hand, to its extreme counter-clockwise position.

STEP (4) Place the new knob D all the way down on the shaft A and position the knob D so that the white dot E on the knob D lines up with the word RING.

STEP (5) Without rotating the knob D, tighten the two screws B and C by turning them clockwise.



4-14. REPLACING THE BINDING POST CAPS

This task covers removal and replacement.

INITIAL SETUP:

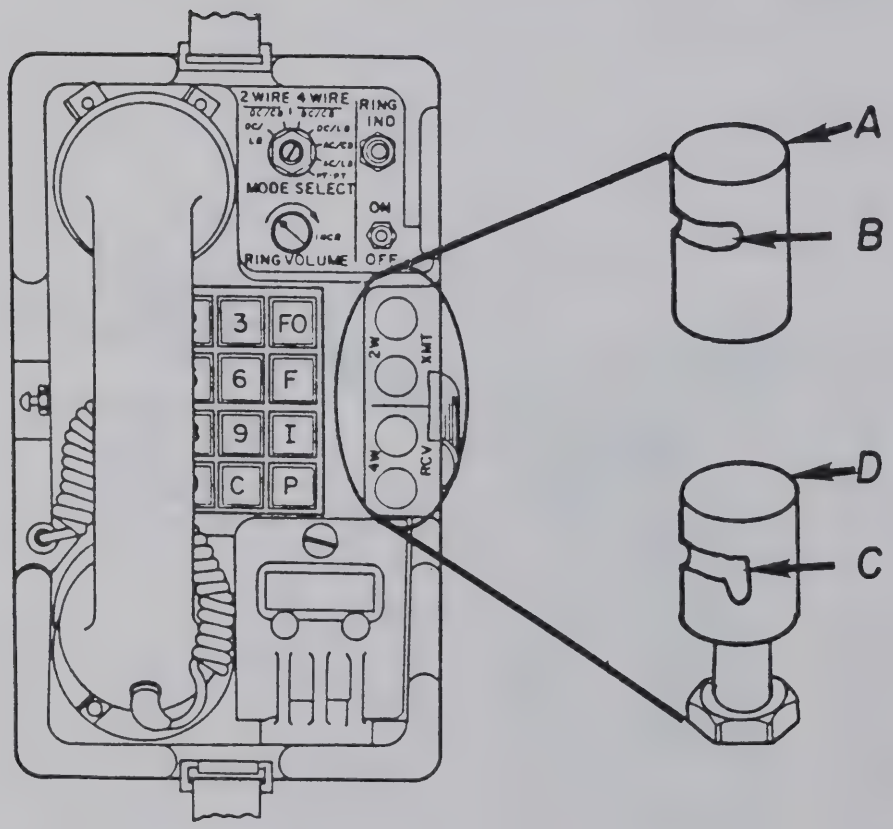
Special Tools: None
Personnel Required: 1
Materials/Parts: 2 red caps and 2 black caps

STEP (1) Use your fingers to twist off each defective cap. Use only as much force as necessary.

STEP (2) Place the correct color cap A on the binding post D.

STEP (3) Slowly turn the cap to align its slot B with the slot C on the binding post.

STEP (4) Use finger pressure to force the new cap on the binding post.



4-15. PREPARATION FOR STORAGE

STEP (1) Do all of the PMCS's for both the OPERATOR (TABLE 2-1) and the ORGANIZATIONAL (TABLE 3-1) levels of maintenance.

STEP (2) All deficiencies must be corrected including the completion of current modification work orders (MWO's).

The above steps apply to all types of storage including:

- Administrative or Short Term Storage (1 to 45 days).
- Intermediate Storage (46 to 180 days).

APPENDIX A
REFERENCES

DA PAM 310-1	Consolidated Index of Army Publications and Blank Forms.
DA PAM 738-750	The Army Maintenance Management System (TAMMS).
FM 21-11	Artificial Respiration
TB SIG-222	Solder and Soldering.
TM 11-5805-650-20P	Organization Maintenance Repair Parts and Special Tools Lists for Telephone Set TA-838/TT. and Telephone Set TA-838A/TT.
TM 11-6625-539-14-3	Operator, Organizational, Direct Support, and General Support Maintenance Manual, Including Repair Parts and Special Tools List; Test Set, Transistor TS-1836C/U.
TM 40-90-1	Administrative Storage.

APPENDIX B
MAINTENANCE ALLOCATION

Section I. Introduction

B-1. General

This appendix provides a summary of the maintenance operation for TA-838/TT & TA-838A/TT. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and test equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

B-2. Maintenance Function

Maintenance functions will be limited to and defined as follows:

a. *Inspect.* To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. *Test.* To verify serviceability and to detect incipient failure by measuring the mechanical or electrical characteristics with established standards through examination.

c. *Service.* Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. *Adjust.* To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

e. *Align.* To adjust specified variable elements of an item to bring about optimum or desired performance.

f. *Calibrate.* To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. *Install.* The act of emplacing, seating, or fixing into position an item, part, module (component or assembly) in a manner to allow the proper functioning of the equipment or system.

h. *Replace.* The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. *Repair.* The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (componenet or assembly), and item, or system.

j. *Overhaul.* That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul does not normally return an item to like new condition.

k. *Rebuild.* Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipments/components.

B-3. Column Entries

a. *Column 1,* Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. *Column 2,* Component/Assembly. Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. *Column 3,* Maintenance Functions. Column 3 lists the functions to be performed on the items listed in column 2. When items are listed without maintenance functions, it is solely for purpose of having the group numbers in the MAC and RPSTL coincide.

d. *Column 4,* Maintenance Category. Column 4 specifies, by the listing of a "worktime" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate "worktime" figures will be shown for each category. The number of task-hours specified by the "worktime" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. Subcolumns of column 4 are a follows:

C—Operator/Crew
O—Organizational
F—Direct Support
H—General Support
D—Depot

e. *Column 5, Tools and Equipment.* Column 5 specifies by code, those common tool sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

f. *Column 6, Remarks.* Column 6 contains in alphabetic code which leads to the remark in Section IV. Remarks, which is pertinent to the item opposite the particular code.

B-4. Tool and Test Equipment Requirements (Sect. III)

a. *Tool or Test Equipment Reference Code.* The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool or test equipment for the maintenance functions.

b. *Maintenance Category.* The codes in this column indicate the maintenance category allocated the tool or test equipment.

c. *Nomenclature.* This column lists the noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

d. *National/NATO* Stock Number. This column lists the National/NATO stock number of the specific tool or test equipment.

e. *Tool Number.* This column lists the manufacturer's part number of the tool followed by the Federal Supply Code for manufacturers (5-digit) in parentheses.

B-5 Remarks (Sect. IV)

a. *Reference Code.* This code refers to the appropriate item in section II, column 6.

b. *Remarks.* This column provides the required explanatory information necessary to clarify items appearing in section II.

SECTION II MAINTENANCE ALLOCATION CHART
FOR
SET, TELEPHONE TA-838/TT AND TA-838A/TT

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			C	O	F	H	D		
00	TELEPHONE SET TA-838/TT AND	INSPECT	0.1						A
	TA-838A/TT	SERVICE	0.1						B
		INSTALL		0.2				1	
		REPLACE		0.2				1	
		TEST		0.2					
		REPAIR		0.3				1	C
		TEST			0.5			4 thru 11	
		REPAIR			0.3			2	
01	CIRCUIT CARD ASSEMBLY	REPLACE			0.3			2	
	(P/O TA-838/TT)	REPAIR				2.0L		2 thru 13	D
01	CIRCUIT CARD ASSEMBLY	REPLACE			0.3			2	E
	(P/O TA-838A/TT)	REPAIR				2.0L		2 thru 13	F
02	HANDSET ASSEMBLY	REPLACE			0.2			2	
		REPAIR			0.2				
03	SHELL ASSEMBLY	REPAIR			0.5			2 thru 11	
		REPAIR				1.5		2 thru 13	

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR
SET, TELEPHONE TA-838/TT AND TA-838A/TT

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	O	TOOL KIT, ELECTRONIC EQUIPMENT TK-101/G	5180-00-064-5178	
2	F,H	TOOL KIT, ELECTRONIC EQUIPMENT TK-105/G	5180-00-610-8177	
3	F,H	WIRE WRAPPING TOOL, HAND P/N P160-2A (82893)	5120-01-071-2998	
4	F,H	MULTIMETER ME-30A/U	6625-00-643-1670	
5	F,H	BALANCE TRANSFORMER	5950-00-235-8730	
6	F,H	TEST SET TS-402	6626-00-230-5149	
7	F,H	COUNTER, ELECTRONIC, DIGITAL READOUT	6625-00-044-3228	
8	F,H	MULTIMETER AN/USM-223	6625-00-999-7465	
9	F,H	OSCILLOSCOPE AN/USM-281A	6625-00-228-2201	
10	F,H	INTERRUPTER, RINGING TELEPHONE KY-834/U	5805-01-014-6310	
11	F,H	GENERATOR, SIGNAL TS-421/U	6625-00-669-0228	
12	F,H	ANALYZER, SPECTRUM TS-723(B)D/U	6625-00-668-9418	
13	H	PRINTED CIRCUIT BOARD TEST FIXTURE (TO BE FABRICATED BY SUPPORT SHOP)		

SECTION IV. REMARKS

REFERENCE CODE	REMARKS
A	CHECK TO SEE THAT RING VOLUME CONTROL IS SET FOR PROPER RINGER TONE LEVEL. CHECK TO SEE THAT MODE SELECT SWITCH IS IN PROPER POSITION. CHECK BATTERIES FOR SIGN OF CORROSION, REPLACE IF NECESSARY. CHECK FOR FRAYED OR BROKEN WIRES OR INSULATION.
B	CLEAN OUTSIDE SURFACES OF TELEPHONE SET USING DRY, LINT-FREE CLOTH.
C	LIMITED TO REPLACEMENT OF HANDSET RETAINING SPRING, CARRYING SLING, TIE-DOWN STRAP, KNOB, CAPS, MICROPHONE SHIELD AND ASSOCIATED HARDWARE.
D	THE CIRCUIT CARD ASSEMBLY, P/N SM-D-790711, WILL BE REPAIRED AT A SPECIALIZED REPAIR ACTIVITY (SRA). THE GENERAL SUPPORT ACTIVITY AT PIRMASENS, GERMANY SHALL BE THE SRA FOR USAREUR. THE GENERAL SUPPORT ACTIVITY AT FORT HOOD, TEXAS SHALL BE THE SRA FOR CONUS.
E	THE CIRCUIT CARD ASSEMBLY, P/N SM-D-986348, DIFFERS IN DESIGN FROM THE TA-838/TT CIRCUIT CARD ASSEMBLY.
F	THE CIRCUIT CARD ASSEMBLY, P/N SM-D-986348, WILL BE REPAIRED AT A SPECIALIZED REPAIR ACTIVITY (SRA). THE GENERAL SUPPORT ACTIVITY AT PIRMASENS, GERMANY SHALL BE THE SRA FOR USAREUR. THE GENERAL SUPPORT ACTIVITY AT FORT HOOD, TEXAS SHALL BE THE SRA FOR CONUS.

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TELEPHONE ORIGINATED SIGNALS

Frequency tolerance:	± 1.3% (except where noted).
Point-to-point ring signal tone:	570 Hz. ± 2%
Seize tone!	2250 Hz.
Release tone!	2600 Hz.
R—Recall/line priority tone:	941 + 1,209 Hz.
C—Conference control tone:	941 + 1,477 Hz.
FO—Flash Override:	697 + 1,633 Hz.
I—Immediate:	852 + 1,633 Hz.
P—Priority:	941 + 1,633 Hz.
F—Flash:	770 + 1,633 Hz.
Tone ringer (aural):	Between 900 and 3,400 Hz.
Digit signals:	
1	697 + 1,209 Hz.
2	697 + 1,336 Hz.
3	697 + 1,477 Hz.
4	770 + 1,209 Hz.
5	770 + 1,336 Hz.
6	770 + 1,477 Hz.
7	852 + 1,209 Hz.
8	852 + 1,336 Hz.
9	852 + 1,447 Hz.
0	941 + 1,336 Hz.

APPENDIX E
DETAILED TECHNICAL CHARACTERISTICS

GENERAL

Microphone element: SM-C-790793
Receiver element: TA-235 ( )/TT

BATTERY

Number required: 4
Type for Arctic areas: BA-3042/U
Type for all other areas: BA-42 or equal
Operating battery voltage: 5.6 vdc
Operating voltage limits: 4.4 to 6.4 vdc
Maximum standby current drain: 1 ma.

TRANSMISSION

Operating temperature range: from −30°F to +150°F (−35°C to +66°C)
Storage temperature range: from −70°F to +160°F (−57°C to +71°C)
Transmission frequency range: 300 to 3500 Hz

LEVEL

Voice: −4dBm +2dB, −5dB (at 1 kHz with a sound pressure input to the microphone of 103 dB, re .0002 microbars)
Single tone signaling, seize;
2250 Hz (−4dBm +dB, −3dB)
Single tone signaling, release:
2600 Hz (−4dBm +2dB, −3dB)
Single tone signaling, point-to-point (ring):
570 Hz (−4dBm +2dB, −3dB).
Dual tone (DTMF) composite: −4dBm +2dB, −3db.
Sidetone, voice: −18dbm (±2db) when output at send terminal is −4dbm at 1 kHz.
Sidetone, digit signal: −40dBm ±5dB
Sidetone, seize signal: less than −60dBm.

ON-HOOK IMPEDANCE

Nominal at 1,000 Hz: 2700 ohms

OFF-HOOK IMPEDANCE

Signalling talking (300 to 3,500 Hz)
600 Ohms nominally

RINGER IMPEDANCE

Common battery (2-wire): greater than 6K ohms
Local battery (2-wire): greater than 8K ohms

EXTENSION CONTROL SENSITIVITY

4-wire mode (up to 3 extensions): 100 ohm maximum per loop - pair to farthest extension.
2-wire mode (up to 1 extension): 25 ohms maximum separation.